THE IRON TRADE REVIEW

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Russia Buys American Plates

After suspending the tariff—Eastern mills report some improvement in orders

Positive developments are still lacking, but a slight increase in interest in the market has caused more cheerful feeling in some sections. Implement manufacturers who have been very slow to place orders are now inquiring for their steel bar requirements for the year beginning July 1 and makers are not disposed to quote so far ahead. In the depression in iron and steel which is all but world-wide, Russia, so troubled in other respects during past years, is now buying freely and has been compelled to suspend its tariff in order to import from the continent and America. American mills have furnished 10,000 tons plates for Russia to meet in part the home shortage. It is estimated that Russian buyers have placed fully half a million tons of iron and steel products with continental companies. Inquiries are now pending before American rail makers for 30,000 tons for Australia and 7,500 tons for Brazil. The export trade from this country continues good.

Pig Iron

An eastern Pennsylvania company, which usually buys from 10,000 to 12,000 tons of basic per quarter, is sounding the market and some other basic business is pending, but throughout the country the condition of firm prices and dull business continues. Many foundries are operating at only about 50 to 60 per cent of capacity and find that the iron which they have already purchased is ample to provide for their early requirements. Hence they are not interested in placing further orders. A Philadelphia company has purchased 2,000 tons of second and third quarter malleable at about $13.50, furnace. Some Pennsylvania furnaces, which recently resumed, continue to offer No. 2X at $13, furnace, or $14.80, Philadelphia, which is slightly below the minimum on eastern brands. One of the few recent transactions in Bessemer was the sale of 1,500 tons to a Cleveland melter at $14, valley, for second quarter.

Railroad Buying

Indications of a slightly better attitude of the railroads toward buying have developed in eastern territory, where one company reports that railroads have released specifications on a considerable quantity of track fastenings and have made some additional purchases, particularly of bolts. Some orders of good size for splice bars, including the year's requirements for the New Haven have been placed. The Southern railroad has awarded 9,000 tons of rails to the Tennessee company and 2,500 to the Illinois Steel Co. The Northern Pacific is inquiring for 20,000 tons and the Missouri Pacific for 10,000. It is expected that the government will soon ask for bids on the Alaskan railway, which will require from 50,000 to 60,000 tons of rails and a considerable tonnage of other steel products.

Plates and Shapes

Specifications and new tonnage in structural material entered in the Philadelphia district in the past week have shown improvement. Throughout the central west, although there is a large amount of new building, demand for structural steel continues to be very disappointing. Some plate makers are showing increased firmness in their ideas as to prices and eastern mills which quote 1.15c, Pittsburgh, for eastern shipment are quoting higher for shipment west of Pittsburgh. Exceptional conditions surrounded the naming of the 1.10c, Pittsburgh, price recently by an eastern mill.

THE OPEN HEARTH

Closer Relations Would Help

THE symposium of editors of agricultural papers, the first part of which was published in THE IRON TRADE REVIEW of last week and the concluding part in this issue, has brought out some very interesting phases of the modern development of the farm in addition to those to which we referred last week. An editor who does not wish his name published expresses his desire to venture an opinion. He says:

"In spite of the general reports of good crops and prosperous conditions among farmers, we believe there is a disposition to retrench this year. While the effect of the new tariff upon prices of farm products is rather difficult to trace, we believe it would have a tendency to keep some farmers from making heavy investments in machinery. We have enjoyed a long period of great prosperity in agriculture and it would be contrary to history if we did not soon experience a period of relative conservatism."

Naturally, as some of the editors have pointed out, farmers in some sections are buying implements much more freely than in other sections, but, taken as a whole, we are convinced that, as the editor above quoted says, there is a decided disposition to retrench. The direct effect of the tariff probably has not been important up to the present time, but fear that the low tariff will be disastrous is an important factor contributing to the present very serious depression. Moreover, THE IRON TRADE REVIEW believes that a tariff law which so seriously impairs the protective system as does the present law, will, in time, be disastrous to the farmers as well as to the manufacturers. The farmer cannot prosper when the manufacturer suffers from free trade.

The letters contain some very valuable hints to manufacturers, as, for example, Editor Wallace, of the *Farmer,* St. Paul, describes the general trend of agricultural development, which, he says, manufacturers sometimes fail to appreciate. He points out that the manufacturer who has been expecting to sell his product to the grain growing farmer may be compelled to revise his selling methods in dealing with the new type of farmer which is now being created.

The increasing use of iron and steel products as pointed out by Editor Bayard, of *The National Stockman,* will be surprising even to some people who have kept in touch fairly well with the modern development of the farm. The remarks of Editor Wallace in regard to the large tractor illustrate how many manufacturers can make mistakes. No doubt the large number of tractors still held in the warehouses of manufacturers are a factor in the present unsatisfactory conditions.

The most important point to be made in connection with this symposium is that it furnishes new and impressive evidence of the importance of the relations of different lines of business to each other and suggests that all would be benefited by establishing closer relations.

High Time to Change

RAILROAD storekeepers, to whose care are entrusted the gathering and shipping of railroad scrap, have been a large factor in the present confusing condition of the scrap market, especially in the Chicago district, where some materials are sold on the gross ton basis and others by net tons.

A railway purchasing agent, recently, in discussing the question why eastern markets from Youngstown to the Atlantic buy and sell exclusively in gross tons, while west of Youngstown both methods are in vogue, recalled that several years ago there was even more confusion than at present and storekeepers of a number of western lines formed a new classification which provided that all railroad scrap was to be listed in net tons except car wheels and steel rails.

At the time this action was taken, no reason was given to justify the west in dealing in net and gross tons while the east used gross tons exclusively, and the railway official in question parried the inquiry as to why net tons are used in the west with an identical question as to what situation dictated the use of gross tons in the east. To one who had not studied the subject, one question is as unanswerable

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as the other, but in reality there are strong arguments in favor of uniformity, and when this is conceded, it must be granted that there is more reason for adopting gross tons than net tons. As we have heretofore pointed out, it is estimated that 85 per cent of the scrap is handled on the gross ton basis. It would be much easier to add to the tonnage already handled by gross tons, that which is dealt in by net tons, than to follow the opposite policy.

Confusion, crookedness, and, in some cases, according to well informed scrap dealers, positively dishonest practices result from the present double method of handling old material. It is high time to make a change.

Say the Word, Mr. President

OUR Washington correspondence recently has indicated that the anti-trust legislation now pending in congress has been toned down to a considerable extent. This is well, as far as it goes, but what the country needs is rest from all unnecessary agitation. The congressmen, realizing that the time when their political fences must receive attention is rapidly approaching, have shown no keenness to tackle this legislation and it is probable that they would be glad to drop the whole thing, if the president would speak the word. The bills, even as amended, involve many questions upon which there is room for wide difference of opinion and prolonged discussion in both senate and house. Neither the members of congress nor people in general have had time to study the bills and every person who is affected should be given an opportunity thoroughly to understand the issues involved and to make recommendations to his congressmen.

We heartily approve the resolution of the Merchants' Association of New York, which says:

"In view of the impressive disapproval which has been generally expressed in the hearings thus far had upon these bills before several committees of congress, and in resolutions adopted by numerous commercial organizations representing many localities and business interests, and in the press throughout the country regardless of political affiliations, we believe a wiser course will consist in postponing final action until the next session of congress, and in utilizing the interval to ascertain the sense of the country concerning the proposed legislation, which cannot fail to have a most profound and far-reaching influence on the conduct of the industry and commerce of the nation, and, therefore, on the welfare of the people of the entire country."

For the sake of thousands of workingmen now idle and many other thousands who are in danger of being discharged at any time, or of having their wages materially reduced, we appeal to the president to say the word which will stop the agitation which is now doing so much to make worse the highly unsatisfactory industrial conditions.

The Other Fellow's Troubles

PETER WITT, street railway commissioner of Cleveland, made a speech at Toledo the other night on the traction situation in that city. Among other things, Mr. Witt said:

"Get rid of the low fares at special hours during the day. You are giving the workingmen special privileges. Why should they have it any more than the officials of the company?"

We congratulate Mr. Witt upon seeing the light at last. For years he was a most radical labor leader and advocated all the special privileges which the labor unions demanded. Now, however, Mr. Witt is in the position of an employer and sees how utterly unreasonable a labor union often is. How hard it is for a man to put himself in the other fellow's place! But sometimes he is thrust into that place or works into it for other reasons than the hope of getting a different viewpoint on questions relating to capital and labor.

If every employer were an employe for just a little while, and at the same time every employe were to experience the troubles of an employer, what a changed world this would be!

Prices Present and Past

Quotations on leading products today, average for last month, average for three months ago and average for April, 1913. Prices are those ruling in the largest percentage of sales at the dates named.

	Today's prices.	Average for March, 1914.	Average for Jan., 1914.	Average for April, 1913.
Bessemer pig iron, Pittsburgh..	$14.90	$15.15	$15.00	$17.92
Basic pig iron, Pittsburgh.....	13.90	13.96	13.42	16.77
No. 2 Fdy. pig iron, Pittsburgh	14.15	14.15	13.70	16.71
Northern No. 2 Fdy., Chgo....	14.25	14.25	14.25	17.00
Ferro manganese, Baltimore....	38.00	38.50	36.50	61.75
Lake Superior Charcoal, Chgo..	15.50	15.50	15.50	18.00
Malleable Bessemer, Chicago...	14.25	14.25	14.25	17.15
Southern No. 2, Birmingham...	10.50	10.63	10.50	12.56
Southern Ohio No. 2, Ironton..	13.50	13.25	13.00	15.63
Basic, eastern Pa.....	14.25	14.25	14.00	16.50
No. 2X Virginia furnace.....	12.75	12.75	12.75	15.00
No. 2X Foundry, Philadelphia.	15.00	15.00	14.75	17.50
Bessemer billets, Pbgh. and Ygn.	21.00	21.00	20.00	29.00
Op. h'rth billets, Pbgh. & Yn.	21.00	21.00	20.00	29.50
Bess. sheet bars, Pbgh. and Yn.	21.50	22.00	21.00	29.50
Op. h'th sh. bars, Pbgh. & Yn.	21.50	22.00	20.60	30.00
Steel bars, Pittsburgh.....	1.15	1.20	1.20	1.40
Iron bars, Philadelphia.....	1.22½	1.27½	1.27½	1.67½
Iron bars, Cleveland.....	1.25	1.25	1.30	1.65

	Today's prices.	Average for March, 1914.	Average for Jan., 1914.	Average for April, 1913.
Iron bars, Chgo. mill.....	1.15	1.17½	1.20	1.57½
Beams, Pittsburgh	1.20	1.20	1.20	1.45
Tank plates, Pittsburgh.....	1.15	1.20	1.15	1.45
Sheets, blk., No. 28, Pittsburgh	1.90	1.95	1.86	2.35
Sheets, blue ann., No. 10, Pitts.	1.40	1.40	1.37	1.75
Sheets, galv., No. 28, Pitts....	2.90	2.95	2.86	3.50
Wire nails, Pittsburgh.....	1.60	1.60	1.55	1.76
Connellsville fur. coke, contr...	2.00	2.00	1.85	2.50
Connellsville fdy. coke contr...	2.50	2.00	2.50	3.19
Heavy melting steel, Pittsburgh	12.00	12.25	11.05	14.44
Heavy melting steel, eastern Pa.	11.00	11.00	10.50	13.75
Heavy melting steel, Chgo.....	9.25	10.25	9.70	12.50
Heavy cast, eastern Pa.....	13.00	13.00	12.50	13.25
No. 1 wrought, eastern Pa.....	13.00	14.50	13.50	16.00
No. 1 wrought, Chgo.....	8.50	9.50	9.18	12.25
Rerolling rails, Chgo.....	11.25	11.75	11.50	14.50
Car wheels, Chgo.....	11.00	12.25	11.75	17.00

(For Additional Prices See Page 728.)

Some Inquiry for Basic Pig Iron

But very few transactions are being closed—Developments in New York district not favorable

Eastern buyers of basic, including the Central Iron & Steel Co., Harrisburg, are sounding the eastern Pennsylvania market for round blocks for third quarter or beyond. The Central company buys about 12,000 tons quarterly. Makers are slow to quote so far ahead. Eastern basic has been untested recently at $14.25 to $14.50, delivered. Another eastern consumer asks 400 tons of basic. The eastern Pennsylvania iron market remains quiet, though a few transactions of good size are moving. In the Philadelphia district a sale of 2,000 tons of lake malleable for second and third quarter was made at a reported price of $15.75, delivered. This same buyer has been asking 500 tons of foundry. The Norfolk & Western railroad closed for 600 tons of malleable and 300 tons of charcoal for second quarter, completing its recent inquiry. A Lansdale, Pa., pipe maker took 1,000 tons of practically No. 3 additional at $14.25, delivered, making its recent purchases 3,000 tons. A sale of 2,500 tons of foundry was made by a central Pennsylvania furnace. A Trenton buyer asks 1,000 tons of malleable. Eastern Pennsylvania makers ask from $14.25 to $14.75, furnace for No. 2X. or $14.90 to $15.50, Philadelphia. Some western Pennsylvania iron is offered at $14.80, Philadelphia, however. Low phosphorus is dull. Some small lots of foreign hematite are being received at Philadelphia.

Valley Bessemer Sold at $14

A Cleveland melter has taken 1,500 tons of second quarter Bessemer from a valley furnace at $14, valley, which has represented the market for this grade the last fortnight. No other sales of importance have been announced. An inquiry, which first appeared several weeks ago, for 10,000 tons of basic, is still pending. Small lots of No. 2 foundry and malleable are commanding $13.50, valley. Mary furnace of the Ohio Iron & Steel Co., at Lowellville, Ohio, is scheduled to go out shortly. She is running on basic iron.

New York Looks Weaker

The New York pig iron market shows up less favorably than for several weeks previously and the undertone seems weaker. An attractive tonnage doubtless would bring out price concessions. New inquiry is lighter and buyers seem more timid to close. The Bridgeport Malleable Iron Co., Bridgeport, Conn., has purchased a small lot of high silicon iron, but has withdrawn an inquiry for 2,000 tons of No. 2X because the market has appeared weaker. This buyer was quoted $15.45, delivered, for No. 2X, this price being attributed to Pennsylvania makers. Buffalo iron is understood to have been quoted uniformly at $13.50, furnace, or $15.95, delivered, in this case. A Cartaret, N. J., buyer bought 500 tons of second quarter No. 2X at about $15, delivered. The Lackawanna railroad placed 350 tons of foundry for Scranton with a Buffalo maker. An Elizabethport, N. J., inquiry for 500 tons, is inactive. Lehigh valley No. 2X was quoted at $14.80, Jersey points, or $14, furnace, in the week. Several thousand tons of export inquiry remains unclosed.

Eastern Inquiry at Cleveland

Considerable inquiry from the east has been received in Cleveland by one firm during the past ten days, but buyers are apparently sounding the market and no sales have resulted. In the immediate Cleveland district, the demand continues extremely limited, but prices are maintained. Foundries are operating at from 60 to 70 per cent, the foundries turning out light castings being busier than those making heavy castings.

Very Dull at Cincinnati

The Buhl Malleable Co., Detroit, has purchased 2,000 tons of malleable iron and the Norfolk & Western railway has closed for 600 tons of the same grade and 300 tons of charcoal iron. These are the only transactions of

(*For Complete Prices see page 728*)

note during the past week, and the dullness of the market is unparalleled in its history. Contracts are mostly for small tonnages or carload lots to fill in on old orders, and even these are very scarce.

Southern prices are from $10.50 to $11, Birmingham basis, for No. 2 foundry iron for the second quarter, and it is not known whether these could be done for the second half because of the lack of transactions to form a basis of comparison. Furnaces offering iron at $10.50, Birmingham basis, report that even this low figure has not induced buying.

Southern Ohio furnaces are firm at $13.50, Ironton, for No. 2 foundry iron for the second quarter, and are almost daily refusing small tonnages at lower prices. It is not known that any sales have been made at this figure except to fill in on old orders.

Dull at St. Louis

The St. Louis market virtually is devoid of inquiry for pig iron, with the exception of the one for 500 tons of high manganese pig, which has been out for several weeks. Sales last week were about as dull as they well could be. One agent reports sales of 300 tons of southern No. 2 at $10.75, Birmingham, and another of 100 tons of southern No. 2 at $11, Birmingham. The nominal price here is $11 for southern No. 2, but $10.75 and perhaps $10.50 could be done. Northern iron is unchanged at $14.25, Chicago furnace, and $13.50, Ironton, with no inquiry.

No Change at Chicago

The unusual situation of almost entire absence of inquiry and buying, with firmness in prices, is presented in the pig iron market at Chicago. Ordinarily with the market in the condition presented now furnace men would be anxious about tonnage for second half. At present not only are they indifferent as to contracts beyond July 1, but actually are discouraging inquirers from contracting. Quotations for future delivery are at 50c to 75c above present prices and practically nothing is being booked at this range.

About 50 per cent of productive capacity is active and while bookings probably were in excess of the possible make, some deferring of shipments is being experienced and the result is output and shipments are about evenly balanced. No iron is being piled, as sellers are able to make shipments of all the iron produced.

Northern No. 2 foundry and malleable Bessemer are still quoted at $14.25, Chicago furnace, with no tendency to quote lower prices and a determination on the part of makers to prevent quotations going closer to the cost level than at present.

Southern iron is extremely dull with purchases limited to carloads or 100-ton prices remaining practically what they have been for several weeks. Nothing lower than $10.50 for No. 2 foundry, Birmingham, is believed possible and some specialties are being quoted as high as $11.50 per ton, Birmingham.

Cincinnati Awards Pipe

To the largest producer—Will soon be in market for larger tonnage

The city of Cincinnati has awarded the contract to the United States Cast Iron Pipe & Foundry Co., through Service Director Philip Fosdick, for 4,000 tons of 36-inch cast iron pipe for nearby delivery. The prices involved are $21.60 for the pipe and $65 for some tested specials. The next lowest bid was $23 for the pipe and $75 for the tested specials. The city of Cincinnati will soon be in the market for an additional tonnage of pipe which will bring the total purchase up to about 10,000 or 15,000 tons.

Cast Iron Pipe Dull at Chicago

An unusual period of quiet is apparent in the cast iron pipe business in the Chicago district at a season when usually cities are buying heavily and contractors are taking considerable supplies for spring work. Comparatively little tonnage is pending and orders for small quantities on contract work are nearly absent from the market.

The supply line for Highland Park, Mich., is still under discussion as to the sort of pipe to be used and the impression gains that it will not be iron. South Bend, Ind., will let 300 to 800 tons this week. A small tonnage at Hammond, Ind., amounting to less than 100 tons, has been taken by the Lynchburg Foundry & Machine Co.

Slight Gain in East

At New York, the cast iron pipe market is a little more active than in March, but not up to January and February level. Some price irregularity continues and on small-sized pipe, less than $20 at eastern foundry, or about $21.25, New York, is being quoted by several shops. The Donaldson Iron Works, Emaus, Pa., has 1,770 tons of 6 to 20's and specials from James McAvoy, the general contractor, for the New York water board. The Melrose Construction Co. has the general contract for 1,500 tons of 6 to 12's for the department of water supply, gas and electricity, New York City, and the pipe is expected to go to the Warren Foundry & Machine Co. The United States Cast Iron Pipe & Foundry Co. has taken 800 tons of 20's for the Lackawanna railroad; R. D. Wood & Co., 200 tons for Bloomfield, N. J., and bids have been taken on 860 tons for Allendale, N. J. Framingham, Mass., is out for 620 tons of 18's to close April 20; Manchester, Mass., for 500 tons of 14's to close April 16, and Quincy, Mass., for 450 tons of small pipe to close April 15. A private letting, involving 2,000 tons for a water line on Long Island, is pending.

Weakness

Displayed by semi-finished material market

Failure of billets and sheet bars to respond to advances announced two weeks ago has caused disappointment among Pittsburgh and valley manufacturers. Instead of reflecting strength at the beginning of the second quarter, the market has displayed slight weakness, sheet bars having been obtained at less than the general asking price, $22, mill. Wire rods and muck bar are nominally quoted at $26 and $28, Pittsburgh, respectively.

Light Demand at Ashland

At Ashland, Ky., the demand is light, but the tonnage sold during the past week was as heavy as that of the week previous. Prospective business is encouraging. Prices are unchanged at $21, Ashland, Ky.

Virginia Buyer Inquires

A Richmond consumer asks 1,500 to 2,000 tons of small billets for second quarter. Eastern Pennsylvania makers are doing about $21, Pittsburgh, or $23.40, Philadelphia, on fair lots of rolling billets, but the market on a round tonnage is not defined. Forging billets are held at $4 higher. Specifications are good relatively, but new business is moderate.

The Garwood Gas Lamp & Heater Co., Canton, O., has increased its capital stock from $60,000 to $250,000.

(For Complete Prices see page 728)

Still Cutting in Sheets

Mills often ignore Pittsburgh basis to protect their own territory

Leading sheet manufacturers in the Pittsburgh district say specifications came out in better volume last week, but new buying continues light, at low prices. No. 28 gage black and galvanized sheets are selling at 1.90c and 2.90c, respectively, and in isolated cases at even less, although some tonnage is bringing $1 and $2 a ton above those figures. Sheet mill operations were reduced slightly last week.

Pittsburgh Basis Ignored

Mills in the Youngstown district continue to quote prices on a basis of 1.90c for No. 28 black, 2.90c for No. 28 galvanized and 1.45c for No. 10 blue annealed, all at Youngstown plants, thus disregarding the Pittsburgh basis. The demand in the Cleveland district is slack.

Sheets Weaker at Chicago

Although Chicago sheet makers have attempted to hold prices at the quotation ruling during January and February, shading by interests further east has had the effect of reducing quotations here and such business as is going is being done at 2.08c to 2.13c and 3.08c to 3.13c, Chicago mill, respectively, for No. 28 gage black and galvanized. This is practically $2 per ton lower than the prices quoted the early part of the year.

Local mills have determined that as soon as they need the business they will protect the local market against low quotations from mills between here and Pittsburgh and make the issue a local one against all who may seek to sell in this territory by taking advantage of their freight rate situation.

Sheets Better at Cincinnati

The Cincinnati market has improved a little during the past week, but orders are below the capacities of the mills, being confined mostly to special grades. The good weather of the past week did not bring the demand for building purposes that was expected by makers. Blue annealed sheets No. 10 gage are quoted at from 1.55c to 1.60c, black sheets No. 28 gage at from 2.05c to 2.10c, and galvanized sheets No. 28 gage at from 3.05c to 3.10c, all Cincinnati basis.

Tin Plate Mill Busy

Western Pennsylvania and eastern Ohio tin plate mills are running at practically full capacity, and owners express satisfaction with the situation. Little new tonnage is being sold, and the prevailing quotation does not always represent the market.

Buyers of Sheets in eastern Pennsylvania territory have been less active the past week in closing for miscellaneous lots for quick delivery. This class of business has been the backbone of the eastern market. Forward buying is small. On carloads or larger, 1.40c, Pittsburgh, or 1.55c, Philadelphia, for No. 10 gage blue annealed is the usual price.

The Wambold Mfg. Co., brass founder, 3009-3021 Lisbon avenue, Milwaukee, Wis., has been placed in the hands of a receiver. The schedules just filed show liabilities of $12,594 and assets of $50,051.

Chicago Rivet Market Slack

Bolts, nuts and rivets in the Chicago market continue to remain at the foot of the ladder. These products failed to respond to the impetus given other steel products after the first of the year, and their prices have remained nearly the same since the quiet season of the early winter. Structural rivets may be obtained at 1.73c to 1.78c, Chicago, with boiler rivets at the usual 10c differential higher. Bolt and nut prices are practically unchanged.

Steel Bar Prices Firmer

But concessions still being made on very desirable business

Pittsburgh steel bar manufacturers, so far as known, have not cut the prevailing minimum figure, 1.15c, and they express the belief that the market will not fall below that level. New buying still is light and specifications do not involve heavy tonnages, although they are more numerous than a few days ago.

Eastern Bars Seem Firm

Steel bar makers are receiving fair specifications in the Philadelphia district, but the tonnage is not as good as several weeks ago. Leading makers seem to be holding firm at 1.20c, Pittsburgh, or 1.35c, Philadelphia, despite some occasional contrary reports, but new business is light.

There is no improvement in the bar iron market in eastern Pennsylvania and the mills are operating more irregularly. Common bars are going at 1.15c, mill, or 1.22½c, Philadelphia, and it is reported this might be shaded slightly.

Bar Order Unplaced

In the Cleveland district, a company which caters to the railroad trade has been in the market for 2,500 tons of steel bars. The negotiations have been enveloped with considerable mystery. The best information obtainable is that the contract has not been placed and probably will not be in the near future on account of the conservative attitude of a leading southern railroad. The largest contract pending in this district is 2,000 tons of reinforcing bars for the new filtration plant, for which bids are being received.

Pittsburgh Price Nominal

Absence of buying has made it difficult accurately to represent the bar iron market in the Pittsburgh district. Outside makers are willing to lay down material in that territory at 1.30c, delivered, and the market is not quotable above that figure, although some mills still ask 1.35c.

Pittsburgh Bands Like Bars

Steel bands, like steel bars, are quotable at 1.15c minimum in the Pittsburgh district, and hoops are selling at 1.25c when attractive tonnages are involved. Manufacturers of cold-rolled shafting found it difficult to establish advanced prices after steel bars displayed weakness.

Iron Bars Steady at Chicago

Specifications for iron bars, while not as plentiful as the first two months of the year, continue to be received by mills in the Chicago district and second orders are made sufficient often to lend some encouragement to makers. Some business is said to be going at 1.20c, but attractive tonnages usually obtain a quotation of 1.15c, Chicago. Shading of the latter price has been known within the past month, but mills here claim it is much less apparent than a short time ago. Agricultural implement makers are not in need of as much bar iron as usual at this season, but are expected to enter the market toward the end of the first half.

(For Complete Prices see page 728)

Plate Prices Firmly Held

By eastern mills—Special conditions of a recent sale

All the leading eastern Pennsylvania plate makers are standing firmly against shading 1.15c, Pittsburgh, or 1.30c, Philadelphia, on attractive business and still get 1.20c, Pittsburgh, on miscellaneous lots. Where one eastern maker of limited capacity recently did 1.10c, Pittsburgh, special conditions prevailed. Some eastern makers report a better tonnage taken the past few days. One mill is running 80 per cent full. Some new ship inquiries, which have been pending before eastern builders, have been withdrawn because of the expected repeal of the free Panama canal tolls bill.

Plate Mill Operations Reduced

Pittsburgh plate manufacturers have been able to hold current price despite efforts of consumers, and the market has not fallen below the 1.15c level, although it is understood tonnage has been offered at less than that figure in isolated cases. Heaviest consumers are not specifying fully, and new buying continues light. Mills are not producing more than from 55 to 60 per cent of capacity.

Plates Slow at Cincinnati

Sheared plates are slow and the past week has been almost void of inquiry. Prices are unchanged at 1.30c to 1.35c, Cincinnati.

Chicago Plate Market Quiet

No change in the situation as to steel plates has presented itself in the Chicago market the past week and plates continue one of the weakest spots in the steel market. Although some sellers claim they are booking some business at 1.38c, Chicago, others are doing 1.33c, Chicago. There is so little demand for this class of goods that the market is practically nominal and presents no features of interest, with mills running far below capacity.

Large Contract

For wire nails taken by Jones & Laughlin

The Jones & Laughlin Steel Co. has been awarded the contract by the navy department to furnish the requirements of wire nails and wire of the various navy yards over the last half of the current year. The contract calls for about 20,000 kegs of nails and 50,000 pounds of wire.

There is no change in the situation for wire products at Pittsburgh. New buying has not been heavy enough to test prices and specifications are far from normal for this time of the year. Jobbers are well stocked and show no interest in the future. Cut nails continue to be held at 1.60c. The American Steel & Wire Co. is operating at about 60 per cent of capacity. It is having little difficulty of disposing of its reduced output at a fair price.

Quiet at Ashland

At Ashland, Ky., wire rods are quiet and sales made during the past week have been lighter than those of the week previous. The quotation is $26.50, Ashland, Ky.

More Inquiry for Scrap

In Cleveland district—Little buying throughout country

A slightly better tone is evident in the Cleveland scrap market, due to a broadening of inquiry from consuming mills. However, actual business is light and with the exception of borings and turnings, which have advanced 50 cents a net ton, prices are unchanged. The embargo on shipments to the Upson Nut Co. is still in force.

Chicago Scrap is Lifeless

Nothing has occurred in the Chicago market to help scrap out of the slough in which it has foundered for some time. Prices remain nominal at the same level as has been the case for a fortnight, with practically no buying. Dealers are not attempting to force matters for fear of putting prices even lower than they are. Almost 10,000 tons of railroad scrap are before the market to be closed within the next few days, and an unusual proportion of this is No. 1 railroad wrought, the Santa Fe offering 1,000 tons and the Southern railroad about 1,600 tons of this quality. The C., St. P. & M. O. offers 1,100 tons, the New York Central 1,400 tons and the Southern railroad 5,000 tons, which includes 1,000 tons of long steel rails, the Santa Fe 1,200 tons, the Baltimore & Ohio 200 tons and the Queen & Crescent 463 tons.

Scrap Lower at St. Louis

Scrap iron is very inactive in St. Louis, with consumers out of the market. Prices are down on some items. The Southern Railway Co. will close a list this week for 1,000 tons; the Terminal Railway Co. one for 1,500 tons; the Missouri, Kansas & Texas Railroad Co. one for 3,000 tons, and the N. O. & N. E. Railroad Co. one for 300 tons.

Prices Fluctuating at Cincinnati

Dealers are making strenuous efforts to secure business and as a result prices are fluctuating over a wide range. Quotations are being made independently of any general market level, and differ on almost every transaction. The books of one local dealer show that bundled sheet scrap, stove plate and machine shop turnings have sold the best during the past week, but the tonnages are extremely light. The market is featureless and very dull.

Pittsburgh Dealers Waiting

Prices of iron and steel scrap in the Pittsburgh district are considered nominal; there has not been enough activity lately to test quotations. Some middlemen are asking $12.50 for heavy melting steel, but, on the other hand, several consumers are refusing to pay above $11.75. Dealers appear content to wait for better times, expressing the belief that conditions cannot get much worse.

Eastern Pennsylvania Scrap Dull

Extreme dullness has marked the position of eastern Pennsylvania old material the past week. Odd carloads have supplied the principal activity and prices in such trading are unchanged. Shipments are chiefly against old orders, taken at better prices than now prevail, but any lots under pressure are going at the market.

Scrap Dull at New York

There is little activity in new selling of scrap by New York dealers. Sales remain miscellaneous and small. One lot of 500 tons of heavy melting steel went at $11, delivered, eastern Pennsylvania, and small lots of heavy cast brought $12.25, delivered, Jersey points. While the market is dull and heavy, dealers are reluctant to go short very extensively for fear of a quick turn.

J. R. Jones, of the Alan Wood Iron & Steel Co., Philadelphia, has gone to California for an extended stay.

(For Complete Prices see page 728)

Coke Market Marks Time

With some tendency toward weakness—Very little selling

The market for Connellsville coke has been quiet the last fortnight, and there is a slight tendency toward weakness, particularly for spot delivery. Consumers who covered only one-third of second quarter requirements have showed no desire to buy for May and June delivery. Contract furnace coke is held at $2, but $1.90 is being done for prompt shipment. The market for foundry coke is unchanged in position. The Connellsville *Courier,* for the week ending April 4, says production was 356,320 tons, as against 360,018 for the week before, a decrease of 3,698 tons.

In the Cleveland market, there is some demand for foundry coke, but sales are not numerous. One producer of standard foundry coke is quoting $2.55, ovens, for delivery to July 1 and $2.75 for the last half. Another company quotes $2.75 to the end of the year, and that is the usual quotation.

Quiet at Cincinnati

Pocahontas furnace coke is being offered by one dealer at $2 per ton, ovens, for prompt delivery, but the majority of operators and agents are holding firmly at nothing less than $2.10, ovens, for immediate delivery, and are quoting higher for contract shipment. Connellsville and Wise County coke are about the same in price, the minimum figures for spot shipment being $1.90 for furnace grades and $2.40 for foundry grades, per ton, ovens. New River coke is higher proportionately than any of the others, furnace coke from this district being as high as foundry coke from the other fields. The market is very quiet, and no important sales are reported made since the purchase of about 45,000 tons of Pocahontas coke by a southern Ohio furnace ten days ago.

No Activity in Coke at St. Louis

Coke remains sluggish at St. Louis, with prices unchanged from last week. There is no new inquiry reported, but demand for shipments on contracts is good.

Light Warehouse Business

At Cincinnati good weather has not brought the improvement that was expected and the market is very quiet. Demand is mostly for twisted reinforcing bars, plates and shapes, but orders are extremely light. Prices are unchanged but dealers state that they are uncertain in cases such as blue annealed sheets No. 10 where secret underbidding of the market has brought quotations down to $2 as the minimum figure, although all the larger houses are holding at a higher level.

Iron and Steel Pipe Dull

Manufacturers of iron and steel pipe in the Pittsburgh district find conditions are decidedly dull. Specifications against contracts have been coming out in fairly good volume, and orders for 1,000 tons of oil country goods have been taken, but demand for large sizes of standard pipe is light. Prices are being held, makers say. There is no change in the situation for boiler tubes.

Big Plate Tonnage Released

The final awarding of the large tonnage of steel for the third tracking of elevated railroads in New York City will release about 20,000 tons of plates. The Carnegie Steel Co. will furnish the largest part of this, but eastern Pennsylvania mills also will get considerable tonnage. Worth Bros. will supply 1,200 to 1,500 tons of plates for a coal freighter recently awarded the Newport News Ship Building & Dry Dock Co., while the Carnegie Steel Co. gets 600 tons of shapes and bars. New York City took bids Tuesday on a riveted line for the Catskill aqueduct requiring about 4,000 tons of plates. The general price on plate lots of any size is 1.31c, New York, or 1.15c, Pittsburgh.

Buffalo Pig Iron Sales Light

Furnaces in the Buffalo district have not booked enough iron in the past week to make it worth while to report the total tonnage placed. The lack of buying continues. Inquiries are also light. The encouraging feature of the market, however, is the manner in which specifications continue to come in against iron under contract. This demand is keeping the stacks of the district operating about on a normal basis—fully 80 per cent of the merchant furnace capacity of the Buffalo district is being kept busy producing and shipping out the iron being called for by the melters. Prices remain the same with no variation in the quotations which have prevailed for the past few weeks.

(For Complete Prices see page 728)

METAL MARKETS

New York

April 14.

Copper.—As a result of the holidays, and the general apathy which characterized the market preceding them, the copper market today is largely nominal. There is a tendency toward weakness and few producers now are insisting on more than 14.62½c, delivered 30 days, for electrolytic, and this price could be shaded. On a wholesale contract basis, the market today may be quoted at 14.25c to 14.35c, cash New York. Casting may be quoted at 14.10c to 14.15c and prime lake nominally at 14.62½c to 14.75c. Spot standard today declined £1 8s 9d on the London exchange, the close being £64 5s for spot and £64 11s 3d for three months. Exports to date this month total 13,131 tons, which is considerably less than for the corresponding period in March.

Tin.—Consumers showed a little more interest in their requirements today as a result of the heavy decline. The London market appears to be entirely in the hands of the bears. Today's close was £166 for spot and £168 for three months, a decline of £2 5s since last Thursday. Today's close was the lowest so far this year. In New York, prices are as follows: Spot and April 36.50c; May, 36.62½c; June, 36.75c; July, 36.87½c; August, 37c. Arrivals so far this month total 2,598 tons, and 2,160 tons are still afloat.

Lead.—Independents generally are now willing to sell lead at the same price as the American Smelting & Refining Co., which is 3.80c, for New York shipment, and the market therefore may be quoted flat at this figure. Demand is dull.

Spelter.—Producers have receded somewhat from their position as a result of repeated demands of large consumers for concessions. Prime western brands now may be had in carload lots at 5.20c to 5.25c, New York.

Chicago

April 13.

Business in new metals is restricted and prices are not materially changed from a week ago. Spelter is somewhat weaker while copper remains about the same in spite of the favorable showing of the Copper Producer's Association.

We quote dealers' selling prices f. o. b. Chicago, as follows:

Lake copper, carload lots, 14.50c; casting, 14.50c; smaller lots, ⅛c to ¼c higher. Spelter, car lots, 5.17½c; lead, desilverized, 3.90c; sheet zinc, $7.00, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 38.75c; Cookson's antimony, 7½c; other grades, 6c.

Practically no trading is being done in old metals except between dealers to fill orders taken some time ago. Quotations are purely nominal and no change in the market is apparent except a general weakening in the white metals which is not as apparent as would be the case were the demand not decreasing steadily.

We quote dealers' selling prices f. o. b. Chicago, as follows:

Copper wire, crucible shapes, 13.75c; copper bottoms, 12.00c; heavy red brass, 12.50c; heavy yellow brass, 9.25c; No. 1 red brass borings, 11.00c; No. 1 yellow brass borings, 8.25c; brass clippings, 9.50c; lead pipe, 4.00c; zinc scrap, 4.25c; tea lead, 3.25c; No. 1 aluminum, 14.00c; No. 1 pewter, 24c; block tin pipe, 32½c; tin foil, 29.00c; linotype dross, 3c; electrotype dross, 3c; stereotype plates, 4½c; stereotype dross, 3c.

Many Shops Are Fairly Active

Large percentage of capacity contracted for—
Elevated tonnage distributed

At the monthly meeting of the Bridge Builders' and Structural Society, held in New York on April 10, it was shown from careful reports collected by its secretary that during the month of March, 76 per cent of the entire capacity of the bridge and structural shops of the country was contracted for. The eastern division of the American Bridge company is operating at about 85 per cent of capacity.

At New York, the Interborough Rapid Transit Co., after several weeks of delay, finally has authorized the formal distribution of the 50,000 tons of fabricated steel for the third tracking of the Second, Third and Ninth elevated railroad lines. The distribution varies only slightly from the previous unofficial announcements, although there was some late revision and one shop was added to the list. The American Bridge Co. receives 13,400 tons, the McClintic-Marshall Co. 13,600 tons, Milliken Bros., Inc., 7,800 tons, the Pennsylvania Steel Co., 5,550 tons, L. F. Shoemaker & Co., 4,400 tons, the Phoenix Bridge Co., 3,900 tons and the Belmont Iron Works 12,000 tons. The Carnegie Steel Co. will get the largest part of the plain material, including the American Bridge Co., Milliken and probably some other sections. The shape market at New York and vicinity, is making a better showing. Eastern mills are getting more tonnage. The Bethlehem Steel Co.'s Grey mill is running double time. Prices continue at 1.31c to 1.36c, New York, or 1.15c to 1.20c Pittsburgh.

Eastern Specifications Better

A better volume of specifications has come to some eastern Pennsylvania makers of structural shapes the past week; new business also has increased. The Philadelphia market continues to show new work coming out a little more freely. Openly the minimum price on plain shapes with eastern mills is 1.15c, Pittsburgh, or 1.30c, Philadelphia, but there are some reports that this might be shaded. Fabricated competition is very keen and prices are low.

Structural Inquiries Better

Inquiries for structural material have come out in somewhat better volume, in the Pittsburgh district, but prices still are irregular, and competition among fabricators has resulted in decidedly low prices for fabricating material. Including material for two government colliers, about 13,000 tons were placed this week. Shops are running at between 55 to 60 per cent capacity.

Buffalo Develops Numerous Inquiries

Buffalo fabricators report that inquiries and sales of structural shapes are materializing rapidly. This is particularly true of the past week's substantial showing. Every day brings into the market many jobs, and advice of those under contemplation, representing in the aggregate large tonnages.

The new Canadian tariff of $7 a ton, it is said, will not reduce the volume of export business until the Canadian mills have had time to extend their plant equipments to the extent of being able to satisfy the growing demands of the Canadian users of structural.

On the viaduct at Massillon, O., the Riverside Bridge Co., Martins Ferry, O., was low bidder, but it is understood that bids are to be readvertised. About 500 tons will be required.

Shapes Weak at Chicago

Structural shapes, which have been somewhat stronger in the Chicago market than other steel products, appear to have receded somewhat and have come more closely in line with plates and bars.

Structural contracts aggregating 7,600 tons were let in the west the past week, the most important items being 2,622 tons for an addition to the Crane Co.'s plant in Chicago and 2,348 tons for a commercial building at Los Angeles, Cal.

The Massillon Rolling Mill Co., Massillon, O., sheet manufacturer, advises it has inquiries out for about 2,000 tons of structural steel, but has not yet contracted for it. It expects to close for this material about April 20.

CONTRACTS AWARDED.

High school, Bridgeport, Conn., 800 tons, awarded the Phoenix Bridge Co.

Baacker loft building, West Thirty-first street, New York City, 600 tons, awarded to the Passaic Structural Steel Co.

Hasco loft building, West Thirty-first street, New York City, 1,500 tons, awarded to Harris, Silvers & Baker Co.

Structural building for Alliance Machine Co., Alliance, O., 275 tons, awarded to the Mt. Vernon Bridge Co.

Crane Co., buildings, AI, EI, and FI, Corwith plant, Chicago, 2,622 tons, to South Halsted Street Iron Works, Chicago.

Loft building for Adroit Realty Co., 32-34 West Thirty-first street, New York City, 600 tons, previously reported as having gone to an independent fabricator, has been taken by the Hinkle Iron Works.

Commercial building, Los Angeles, Cal., 2,348 tons, to Llewellyn Iron Works, Los Angeles.

Lehman store and office building, Peoria, Ill., 447 tons, to the Rochester Bridge Co., Rochester, Ind.

Firemen's Fund Insurance Co., building, San Francisco, 373 tons, to the Western Iron Works, San Francisco.

Union Square Hotel, San Francisco, Cal., 350 tons to the Ralston Iron Works, San Francisco.

Wood county, Wis., highway bridge, Nekoosa, Wis., 326 tons, to Northwestern Bridge Co., Milwaukee.

Cast house, power house and engine house, Andrews & Hitchcock Iron Co., Hubbard, O., 800 tons, American Bridge Co.

Transmission towers, 1,200 tons, Tennessee Power Co., Chattanooga, Tenn., American Bridge Co.

Two government colliers, 11,000 tons, Maryland Steel Co., Carnegie Steel Co. will furnish plain material.

Scollay building, Boston, 1,000 tons, awarded to the New England Structural Co.

Methodist office building, Philadelphia, 500 tons, awarded to Eastern Steel Co.

Building for Commercial Trust Co., Jersey City, 900 tons, awarded the Belmont Iron Works.

Bridges for Seaboard Air Line, 600 tons, awarded the American Bridge Co.

Bridge across Suwanee river for Atlantic Coast line, 350 tons, awarded the American Bridge Co.

Miscellaneous work, about 500 tons, for New York Central railroad distributed among different fabricators.

Building for Bell Telephone Co., Philadelphia, 4,000 tons; fabrication awarded to Keystone Structural Co. and plain material will be furnished by Eastern Steel Co.

Columbia Hospital, Washington, D. C., 550 tons, awarded to Dietrich Bros.

CONTRACTS PENDING.

Loomis breaker for Delaware, Lackawanna & Western Coal Co. near Wilkes Barre, 1,000 tons; bids taken.

Highway bridge over Scioto river at Portsmouth, O., 2,500 tons; bids entered.

High school, Germantown, Pa., 600 to 700 tons; general contract placed with H. W. Reilly; steel remains open.

Addition to Metropolitan Museum of Art, New York City, 1,000 tons; bids being taken.

Grandstand, for American League Baseball Park, New York City, 1,500 tons, bids asked.

Building for Citizens Trust & Deposit Co., Utica, N. Y., 250 tons, general contract awarded to R. C. Howes, New York City.

Bridges for the Southern Railway Co., 600 tons, bids being taken.

Steel work at Park avenue, New York City, and at Buffalo, for New York Central & Hudson river railroad, 350 tons, bids being taken.

Bids are being taken for the Canadian Kodak building, Toronto, to be built by the Eastman Kodak Co., Rochester, requiring about 2,000 tons of reinforcing bars.

(For Complete Prices see page 728)

Competition from the Continent

Is seriously troubling English mills—Gloomy sentiment at Birmingham meeting

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Apr. 4.

The tone of the pig iron market has been slightly better, with rather more firmness in prices. With some slight fluctuations yesterday's price at Cleveland was 50s 7d ($12.38). The best sign in that market is that makers now quote a premium of 1s (24c) for forward business. Inquiry for future requirements is also rather better, and in a few instances buyers have had to pay a little more for prompt supplies. Stocks continue slightly to reduce, the amount in the Cleveland stores being 120,000 tons. The tone generally is getting more hopeful in Cleveland. In the Midland district, smelters declare they cannot further shade prices, profits having in some cases entirely disappeared. A slight easement has come in the coke department prices, being about a shilling (24 cents) below what they were a fortnight ago.

Finished Iron and Steel

The meeting of the iron trade in Birmingham this week could hardly have been more pessimistic. The spring quarterly meeting is due next week, being placed a week earlier than usual, to avoid the Easter holidays. Generally, the week before the quarterly meeting is enlivened by a good deal of inquiry, with a view to coming business, but this occasion was an exception. Apparently, nobody showed the slightest concern as to coming prices, with the sole exception of merchants buying marked bars. There was some curiosity as to whether these would be reduced. But at present the quotations stand at £8 10s ($41.62). The prices of unmarked iron have been whittled and squeezed down until it is possible to buy Black country iron at £6 10s ($31.62), and even on this basis many mills cannot keep going. It is unusual for marked bars to be more than £1 10s ($7.34) dearer than unmarked, and makers of best iron, therefore, have been bombarded with inquiries suggesting that a reduction must be pending.

The galvanized sheet trade keeps up a good volume of business with prices ranging from £11 2s 6d ($54.48) to £11 5s ($55.10). There are no heavy bookings, but mills manage to make full time. The tin plate trade continues rather on the dull side.

There have been considerable concessions to Scotch makers in the control of prices. This, in fact, has been the only alternative to a complete breakup of the association, and an end of all co-operation in the regulation of prices. The Scotch mills have for months past had to face heavy importations of plates and angles from Belgium, computed to amount to about 8,000 tons per month. The result of this has been to throw idle a good deal of the rolling plant on the Clyde.

Generally, the British mills are doing fairly well, and now that the period for outdoor constructive work has arrived, it is hoped that this will very greatly assist in keeping the mills going. The weak place in the position, of course, is the dullness on the continent, which is diverting a lot of surplus steel, both finished and half-finished, into this country, and that competition is still very keen in all the British consuming markets.

A very promising feature is the excellent demand for steels for motor building, but supplies are restricted by a certain amount of scarcity of alloys. Some rail inquiries are in the market, but mills could turn out a good deal more if they had the chance. There are signs that continental competition will be still keener in the future, as the leading steel works are making arrangements to organize more thoroughly their trans-marine business.

French Iron Trade

Paris, April 1.

One or two rather more cheerful features in the French iron trade have developed during the last few weeks. For one thing, there have been decidedly more inquiries on the market for the home trade, which have led to booking of a fair number of orders, more especially for prompt delivery. But this improved tendency is not yet general, and a number of mills have recently made a bid for export business to Belgium and England, greatly disturbing German interests. Prices have been reduced both in the Loire and the Eastern districts in various instances up to $1.90 per ton. The more decided development of the improvement is held in check mainly by political considerations both in this country and in England. In the Loire district it is more the government that is relied on for improvement; it is known that the navy is about to be strengthened by the building of five new Dreadnoughts of 30,000 tons each, which will especially benefit the Loire mills.

Belgian Iron Trade

Brussels, April 1.

Iron trade conditions here are very slack, especially in the export business, which is feeling very acutely competition in England from the French makers. Half products which had been held steady for some time past, have now been reduced 49 cents per ton, making the quotation of ingots $17.28 to $17.52; billets, $17.76 for 2-inch; $17.52 for 3-inch; sheet bars, $18.74; 24½ cents decline is quoted for steel bars, at $20.69; plates at $23.12; ½-inch sheets at $23.85, and 3/32-inch sheets at $24.34, all f. o. b. Antwerp. For contracts of monthly deliveries of 1,000 tons or more the reduction in the price will be doubly as large. Great efforts to stimulate export trade continue.

German Iron Trade

Berlin, April 1.

There is still no particular cheerfulness to be noted in the German iron trade and conditions at the moment are very unsatisfactory. Pig iron, it is true, is reported to be rather better, and, according to the syndicate, the orders booked for the first half year represent about 81 per cent of the members' full contingent while shipments in March are estimated at about 80 per cent. Under these circumstances, it is considered that prices will be maintained at their present level. Steel bars are one of the weakest spots; prices are extremely irregular, and quotations as low as $21.62 are named from various works. Most bar mills are urging for specifications, and all are able to give delivery at the shortest notice. For hoop iron, orders are solicited at from $27.02½ down to $25.85. Plates are quoted $23.03 for the home market; $22.09 to $22.32½ for export; best brands of sheets are readily obtainable at from $27.02½ to $26.32. In wire and wire products, there is as yet no sign of any relief from the

demoralization which has followed the breaking up of the syndicate. As regards railway material of all sorts, negotiations between the steel syndicate and the state authorities have so far been without result, because the syndicate is trying to maintain prices at last year's level, while the railway minister insists that a material concession should be made. Thus for rails $27.73 is asked, and the government is unwilling to allow more than $25.85. Tram rails are well sold, and mills specializing in pit rails also have fair orders on hand, both for the home trade and for export.

Rice is Slated

For presidency National Metal Trades Association

The following nominations have been made for officers of the National Metal Trades Association and a ballot has been mailed to members of the association:

President—Herbert H. Rice, the Waverley Co., Indianapolis.

First Vice President—L. H. Kittredge, Peerless Motor Car Co., Cleveland.

Second Vice President — George Mesta, Mesta Machine Co., Pittsburgh.

Treasurer—F. C. Caldwell, H. W. Caldwell & Son Co., Chicago.

Councilors for two years—H. N. Covell, Lidgerwood Mfg. Co., Brooklyn; F. F. Beall, Packard Motor Car Co., Detroit; P. O. Geier, Cincinnati Milling Machine Co., Cincinnati, O.; C. E. Whitney, Whitney Mfg. Co., Hartford, Conn.; R. H. Jeffrey, Jeffrey Mfg. Co., Columbus, O.; H. D. Wilson, Wilson-Snyder Mfg. Co., Pittsburgh.

Mr. Covell, who was president of the association a number of years ago, is being returned to serve as councilor. The new councilors are: F. F. Beall, R. H. Jeffrey and H. D. Wilson.

The present officers of the association are: President, W. A. Layman; first vice president, L. H. Kittredge; second vice president, Herbert H. Rice; treasurer, F. C. Caldwell; commissioner, John D. Hibbard; secretary, Homer D. Sayre. The last two are appointive.

Settle Iron Mine Strike

The strike of employes at the Richards iron ore mine, Wharton, N. J., of the Thomas Iron Co., has been adjusted and operations on the property have been resumed. Some concessions in the manner of operating the property were made to the men as individuals, but the company did not recognize the Western Federation of Miners, with whom the miners recently became affiliated.

No Vessels

Are moving, but navigation officially opened

Navigation officially opened on the great lakes on Wednesday, but no vessels put out. There will be no general movement of the fleet until May. Some of the ore shippers have announced that they will be out of the market for wild capacity until June and do not expect to get their own vessels generally moving until May 15. The present prediction is that the ore movement will be about 10,000,000 tons less than it was last year. As there is little demand for coal tonnage and grain chartering is also light, vessel owners are naturally reluctant to start the season. Whatever delay is now experienced will, of course, serve to strengthen the market later on.

Ore is beginning to arrive at Escanaba for shipment by vessel to lower lake ports. The first ore arrived at the docks late Thursday, April 9, and consisted of three trains of 45 cars each.

Relines Blast Furnace

The Reading Iron Co. is relining its Crumwold blast furnace at Emaus, Pa., and has about completed a new equipment of Roberts three-pass stoves at the same plant. Frank C. Roberts & Co., Philadelphia, are the engineers.

Chicago Foundrymen's Club

Chicago, April 13.—An illustration of the use of chemical analysis as a basis for figuring proportions of pig iron and scrap in the cupola of the foundry was presented before the Chicago Foundrymen's Club at the Hotel Sherman, Saturday evening, by W. J. Mulcahey, of the C. C. Kawin Co. His statements were based on tests extending over several years by the Kawin Co. and illustrated the method by which a given analysis in the castings could be reached by proper proportions of pig iron and steel scrap of varied analysis.

Another paper was presented by A. M. Thompson, of the H. W. Caldwell & Son Co., on "Economics in the Manipulation of Sand" in the foundry. This is the first of a projected series of papers giving suggestions for cutting foundry costs. Mr. Thompson showed figures taken from actual experience in his own work indicating savings of several hundred dollars per year by using old cores in connection with new sand in the making of new cores.

A brief announcement of the arrangements of the 1914 foundry convention in Chicago was made by O. J. Abell. The social features of the meeting consisted of a string of stories by Harry Scott and a luncheon after the program.

Middletown Plant is Visited

The American Chemical Society, which held its annual convention in Cincinnati during the week of April 6, spent the entire day April 10 visiting the plants of the National Cash Register Co., Dayton, O., and the American Rolling Mill Co., Middletown, O. A special train with 400 delegates and visiting chemists left Cincinnati at 7:30 a. m. on that day for Dayton, where the morning was spent inspecting the plant of the National Cash Register Co. A noonday luncheon was served its guests by this company, after which the train left Dayton for Middletown, arriving at the works of the American Rolling Mill Co. at 2:54 p. m. After a short address of welcome by Geo. M. Verity, president of the American Rolling Mill Co., the guests were taken in groups of 25 each through that company's east works. The special train then conveyed the party to the company's research laboratory at its central works, and then to its new warehouse, where a short talk was given by G. F. Ahlbrandt, a well known metallurgist and assistant manager of sales of the American Rolling Mill Co., on that company's products. A luncheon was then served after which the delegation of chemists returned to Cincinnati on a special train.

Filtration Plant Requirements

The city of Cleveland will receive bids until noon, April 21, on contract No. 1 for the new filtration plant. The construction, which will include mixing chambers, coagulation basins, filters and main piping, will require 2,000 tons of steel reinforcing bars, for which re-rolled material will not be acceptable; 300 tons of miscellaneous steel and 60 tons of iron castings.

Almost Call Employer "Jim"

And employes are happy—Interesting testimony before industrial commission

Washington, April 14.—"My personal relations with my employes come near to the point where they call me Jim instead of Mr. Dodge, and my door is always open to them," said James M. Dodge, chairman of the board of the Link-Belt Co., maker of elevating, conveying and power transmitting machinery, with one plant each in Philadelphia and Indianapolis, and two in Chicago, when he testified today before the United States Commission on Industrial Relations, which is now conducting hearings on efficiency systems and labor. It was metal trades day.

The Link-Belt Co. has installed the Taylor system of scientific management and the strong recommendation given it by Mr. Dodge, a free and unusually frank witness, was considered by many to have left favorable impression upon the commission which was equal to, if indeed, not in excess of that given yesterday by Frederick W. Taylor himself.

The Link-Belt Co. has operated its Philadelphia plant under the Taylor system for six years, and its other plants have employed it for a somewhat shorter period.

Increased output, increased dividends and higher wages, better health and entire happiness for its employes have been the results of the adoption of the Taylor system by the Link Belt Co., Mr. Dodge said, although the first step leading to these conditions, he pointed out, was the introduction of the Taylor-White high speed steel, and appropriate tools going with its use. No other concern in the world, Mr. Dodge said, had the Taylor system in operation longer than has the Link company at its Philadelphia plant.

Not the slightest trouble of any kind with its men has occurred.

While the production has been greatly increased under the Taylor system, Mr. Dodge could not estimate just what the percentage of gain has been, but said in individual products it has been as high as ten-fold, and in other products two-fold, and thought that, taken on the whole, the increase must be at least two-fold. The quality of output has also been improved and he said that, if he were to ask the president of the company what the greatest benefit arising from the system was, he would reply that it was promptness of delivery, which in the witness' estimation, is the most valuable of all assets in business.

Increases in net profits have never shown to be any great amounts, Mr. Dodge said, because the company has taken advantage of the results to sell at lower prices and pay increased wages. There never has been, since the system was introduced, he said, a fluctuation of more than 2 per cent in earnings and net profits have been, on the average, a little in excess of 9 per cent, with a very substantial increase in wages. He read from actual records of the Philadelphia plant to show the wages men have made under the system with its bonus plan. He cited the wages of one employe for March, 1913, whose employment by straight day work would call for 38c per hour, or $16 per week for 54 hours. But his actual rate was between 65c and 70c per hour, running up between $33 and $40 per week.

Mr. Dodge said he challenged any shop in the country not under scientific management to make a showing such as the Philadelphia machine shop of the company has made, as the average length of employment has been seven years. It was when he was asked by Counsel W. O. Thompson as to the feeling existing between the company and its employes that Mr. Dodge spoke as denoted in the opening paragraph.

No Collective Bargaining

No collective bargaining is provided under the Taylor system, Mr. Dodge said. Every man in the shop has a time study made upon him, it was pointed out, to set a standard of operation and the time in which work is to be done. Should the workman say it cannot be done in the time specified, he is shown, by instruction, that it can be done in the time stipulated.

"But suppose he should insist it can't be done in that time or claim it was unreasonable?" inquired Commissioner James O'Connell, of the District of Columbia.

It struck Mr. Dodge as being incredulous to think a workman would maintain such a position when shown he was mistaken. He said he had never come in contact with such a situation, and added that a man assuming that position is hopeless.

Hours of operation have not been reduced by the company, Mr. Dodge said, because of the Taylor system, although they have been decreased to 54. He maintained that the workmen did not want them reduced, because they can make more money under the present schedule than under a decreased one.

The opinion was expressed by Mr. Dodge that when the unions become interested in the efficiency plan rather than loyalty to the union, a great advance will be made. He said he would greatly welcome any union man, the higher up the better, who would harmonize scientific management and unionism, and predicted that within four years the unions will insist upon the scientific management. He felt sure that "if we (the company) can make 1,000 laborers enthusiastic about scientific management the company can make 100 union leaders enthusiastic about it."

He said he would gladly allow union labor leaders to come into the company's plants, stay a month and study the Taylor system, and felt sure that at the end of that time they would be assured of its mutual benefits and ready to act upon their conclusions.

"I think," said Mr. Dodge, "the labor unions have been fighting something they haven't thoroughly investigated."

Referring to the profit-sharing plan recently adopted by Henry Ford, automobile maker, Mr. Dodge said that his company, too, could inaugurate such a system if, instead of having made 25 cents off of each man, as it has been doing, it had made $5.46, as Mr. Ford did off of each of his men.

William H. Johnston, Washington, president of the International Association of Machinists, was unable to appear, and in his stead P. J. Conlon, vice president of that organization, testified. He said that the union's by-laws provide expulsion from the organization of any member who works under the Taylor or other scientific, bonus or task system. The organization provides for work on a day basis, and calls for trade agreements and collective bargaining.

Out of a number of objections which he said the International Association of Machinists has to efficiency systems are those that the systems require tasks which always increase in intensity; that the systems are devised solely to increase dividends and mean little to the employes; that the

overhead account must be borne by the employes; that no margin is taken into account because of the increase in the cost of living; that prices are arbitrarily set by efficiency engineers and the workman is made an automaton and loses his mechanical initiative, and that the systems build up in the industrial world the principles of sabotage, syndicalism and passive resistance. These principles, he claimed, had never been heard of until scientific management and increased production had been introduced. He asserted that the principles and scientific management came into being simultaneously.

When asked by Counsel Thompson on what he based his statement that the efficiency system had caused sabotage, Mr. Conlon said the workmen had conditions thrust upon them by which the only retaliation they could get was through sabotage and syndicalism.

Mr. Taylor's Testimony

Strikes under his system of scientific management are impossible, according to Frederick W. Taylor, Philadelphia, who testified before the Commission Monday. Declaring that the very essence of the plan is friendship between employer and employe, Mr. Taylor said that where enmity enters, scientific management goes. Not a single strike among workmen operating under the system has occurred since its introduction 30 years ago, Mr. Taylor said, and he estimated that there are between 150,000 and 200,000 employes working under the system.

At great length he went into the plans upon which he introduced the systems in departments at the plants of the Midvale Steel Co., Philadelphia, and the Bethlehem Steel Co., South Bethlehem, Pa.

Wages of workmen under the system have been increased, he said, from 30 to 100 per cent. Criticism of his system was declared to be well intended, but based upon ignorance.

In no uncertain terms he upheld the idea of maximum output as against the doctrine of the American Federation of Labor, advocating restricted output on the plea that increased output meant the throwing of men out of employment. In all his observations, Mr. Taylor said, he had been unable to find a case which did not work out exactly opposite to the Federation doctrine.

"Output produces riches," he asserted, "and the world uses it." He deplored restrictive legislation and gave his approval of redistribution of wealth. While scientific management accrued to the interest of both employer and employe, Mr. Taylor said that finally the public will get the benefit through lower cost. Speeding up, so bitterly complained of by labor unions in relation to scientific management, he said, does not exist with that system, and cannot.

Some Releases

By the railroads—Corporation will buy cars soon

Considerable quantities of frog and switch work, track fastenings and other materials, have been released by the railroads to eastern steel makers during the past week. This development has been productive of some encouragement and is attributed to the press of necessities and to the seasonable weather for track construction. In some cases, the frog and switch work released had been held up, partially manufactured, for some weeks. The buying of track bolts has been especially active, one maker booking aggregate orders for 550 tons. Some good-sized lots of splice bars have been placed, including the annual requirements of the New Haven railroad, which went to the Pennsylvania Steel Co. The Chesapeake & Ohio railroad has divided 3,000 kegs of standard spikes between the Illinois Steel Co. and the Tredegar Co., Richmond. The Jones & Laughlin Steel Co. has taken 500 kegs of railroad spikes for the government for Panama delivery.

Car developments of the week are few. The Southern Pacific continues to take bids on its recent inquiry, but the number of cars to be ordered depends upon prices and other circumstances at the time final action is taken. The award of the 3,500 cars of the Steel Corporation is expected soon. The New York Central at an early date may place 1,500 cars for the Bessemer & Lake Erie railroad.

CARS AND LOCOMOTIVES.

Phelps, Dodge & Co. have awarded 25 ore cars to the Pressed Steel Car Co.

The Chicago, Milwaukee & St. Paul railroad is in the market for 29 passenger cars of different types.

The Chicago & Northwestern railroad will distribute orders for 35 locomotives in the near future.

The Carnegie Steel Co. is inquiring for three saddle tank locomotives for its Homestead works.

The Ferro Carril del Pacifice railroad, Columbia, has placed two locomotives with the American Locomotive Co.

The Pisco a Ica railway has placed one locomotive with the American Locomotive Co.

Chas. S. Powell, agent in Cleveland territory for the C. & C. Electric & Mfg. Co., Garwood, N. J., has removed his headquarters to No. 711 Illuminating building, that city.

Mine Closed

On account of charges of the Union Railroad

Washington, April 14.—In a complaint filed with the Interstate Commerce Commission today, the Monongahela River Consolidated Coal & Coke Co., says that its "Risher" coal mine, Mifflin township, Allegheny county, in the Pittsburgh district, has been closed down because of cancellation by trunk lines of joint rates with the Union railroad, which serves the mine, and additional charges imposed by the Union road when it was cut off, April 1, from concurring rates with the trunk lines. The complainant is a forerunner of many similar ones which are expected, and which promise to affect, to a large degree, iron and steel and allied industries.

The Union railroad made its new tariffs effective on April 1 in line with the action by the trunk roads, taken as a result of the decision by the commission in the industrial railways' case, which referred to so-called allowances made by trunk lines to the affected iron and steel plant rail lines as rebates, and broadly suggested that such allowances be abolished. The trunk line tariffs, becoming effective April 1, apply only to junctions with the so-called industrial roads, among which is the Union railroad. The latter, along with the Pennsylvania, the Bessemer & Lake Erie, the Baltimore & Ohio, and the Pittsburgh & Lake Erie railroads, constitutes the defendants in the Monongahela company petition.

Experiments to be Resumed

The Cedar Point furnace of the Northern Iron Co., at Port Henry, N. Y., at which interesting experiments with the smelting of New York state titaniferous iron ore are being carried on, will resume operations about April 20. The furnace recently was banked and the tests interrupted because of a shortage of concentrated ore. The McIntyre Iron Co. is operating the furnace under lease.

Will Dismantle Furnace

The Rockhill blast furnace plant at Orbisonia, Pa., has been sold by the Rockhill Iron & Coal Co., Philadelphia, to Michlorich & Co., of Harrisburg, old material dealers, and will be dismantled and scrapped. The plant consists of two alternate stacks each 15 x 65 feet, and has a rated annual capacity of 36,000 tons. It last was operated in 1907.

For Constructive Work

Business men of Ohio are to be organized —Cleveland meeting

The organization of the business men of Ohio on a non-partisan political basis was decided upon at the annual meeting of the Industrial Association of Cleveland, held at the Hollenden hotel in that city April 11. There was a large attendance and keen interest was manifested.

During the past year Secretary Hobday, of the association, has personally interviewed over 400 employers in Cleveland and has found a strong sentiment in favor of business men uniting for definite constructive work. There is, of course, some difference of opinion as to details of carrying out the plan. On a motion of William C. Connelly, of the Connelly Boiler Co., the following resolution was unanimously adopted:

"Whereas, It is necessary to safeguard and develop industrial justice and prosperity to devise and make public legislation relating thereto; further, actively to construct laws and policies and to aid in shaping public opinion for securing industrial conditions just to all and worthy the ideals of state and nation:

"Now, therefore, be it resolved, That the president of the Industrial association appoint, with the approval of the executive committee of said association, a special committee of such number as he deems advisable, with power to increase the membership thereof; that said committee have in charge with advisory powers, a plan of campaign for the accomplishment of the foregoing.

"Be it further resolved, That as a factor or element in doing the necessary foregoing things, we approve and indorse the plan of securing a permanent organization of voluntary workers in each of the political precincts of the city of Cleveland.

"Further, that said committee and the governing board endeavor to effect a federation or unification of employers, manufacturers and business men's organizations to the end that there shall be united and concerted action in the state of Ohio for accomplishment of the foregoing things in the preamble hereto declared to be necessary."

Mr. Connelly was nominated chairman of the committee. Other members will be announced later. Officers of the Cleveland Association were elected as follows:

President, C. O. Bartlett; first vice president, J. G. Jennings; second vice president, Charles F. Kurz; treasurer, C. O. Bassett; governing board, W. D. Sayle, L. H. Kittredge, W. B. McCallister, W. B. Greene, Charles Eisele, W. S. Blau, H. C. Bradley, S. C. Dalby, W. C. Sly, W. D. Fuller, J. P. Smith, George F. Thesmacher, L. H. Hays, Conrad Krause, H. W. Stoer, J. P. Bropson, F. B. Hiller, H. G. Schaefer, H. B. McGrath, W. D. Jones, Eb Ellen.

Large Deficit

Of Lackawanna Steel Co. for first quarter

The Lackawanna Steel Co., during the first quarter of 1914, reports a deficit from operations of $445,207, as compared with a profit of $742,520 for the corresponding quarter of 1913, or a total reduction of $1,187,727. The deficit during the last quarter of 1913 was $108,516. The income of the company for the first quarter was less by $1,367,497 than during the corresponding period in 1913. On March 31, 1914, the company had unfilled orders of 191,828, which were 431,988 tons less than on March 31, 1913, but were 6,401 greater than upon Dec. 31, 1913, when 185,427 tons were reported. The unfilled orders of the company since the beginning of 1913, have been as follows: March 31, 1913, 623,816 tons; June 30, 1913, 436,675 tons; Sept. 30, 1913, 255,945 tons; Dec. 31, 1913, 185,427 tons, and March 31, 1914, 191,828 tons.

A comparative statement of the Lackawanna Steel Co.'s income account for the first quarters of 1913 and 1914 is as follows:

	First Quarter. 1914.	1913.	Decrease.
Inc. from mfg..	$154,995	$1,386,028	$1,231,033
Prop. earn invest. etc.	81,051	217,516	136,465
Total	$236,046	$1,603,544	$1,367,498
Int. on bonds..	437,424	437,478	53
Balance	*201,378	1,166,066	1,367,445
Sinking funds...	36,860	107,668	70,808
Deprec., renew..	206,969	315,877	108,908
Total deduc..	$243,829	$423,545	$179,716
Profit	*445,207	742,521	1,187,728
Spec. profit.....	.....	267,200	267,200
Total profit...	*$445,207	$1,009,721	$1,454,928

*Deficit.

The Steel Improvement Co., Cleveland, has started the erection of an additional building to give it more shipping facilities, and the upper story will be used as an office and laboratory. The company makes a specialty of heat treating steel.

Reduced Volume

Of new business reflected in Corporation report

After two months of increasing tonnage, in which the unfilled orders were enlarged by 743,322 tons, the United States Steel Corporation lost from its operations in March 372,615 tons, according to the monthly announcement made April 10. This reduction is in line with expectations and further illustrates the reduced volume of new business in steel products since about March 1. The Steel Corporation's unfilled orders on March 31 are reported as 4,653,825 tons, compared with 5,026,440 tons on Feb. 28, 1914.

A statement of the unfilled tonnage of the Steel Corporation showing the changes in tonnage and percentage by months since the plan of announcing monthly the business on hand was adopted, shows the following:

Date.	Total.	Change, tonnage.	Change, per cent.
Mar. 31, 1914....	4,653,825	372,615—	7.42—
Feb. 28, 1914....	5,026,440	412,760+	8.95+
Jan. 31, 1914....	4,613,680	331,572+	7.74+
Dec. 31, 1913....	4,282,108	114,239—	2.59—
Nov. 30, 1913....	4,396,347	117,420—	2.60—
Oct. 31, 1913....	4,513,767	490,018—	9.79—
Sep. 30, 1913....	5,003,785	219,683—	4.24—
Aug. 31, 1913....	5,223,468	175,888—	3.03—
July 31, 1913....	5,399,356	407,965—	7.03—
June 30, 1913....	5,807,317	517,005—	8.18—
May 31, 1913....	6,324,322	654,440—	9.38—
Apr. 30, 1913....	6,978,762	490,194—	6.55—
Mar. 31, 1913....	7,468,956	187,758—	2.45—
Feb. 28, 1913....	7,656,714	170,654—	2.18—
Jan. 31, 1913....	7,827,368	104,796—	1.32—
Dec. 31, 1912....	7,932,164	79,281+	1.01+
Nov. 30, 1912....	7,852,883	258,502+	3.40+
Oct. 31, 1912....	7,594,381	1,042,874+	15.33+
Sep. 30, 1912....	6,551,507	388,132+	6.29+
Aug. 31, 1912....	6,163,375	206,296+	3.46+
July 31, 1912....	5,957,079	149,773+	2.58+
June 30, 1912....	5,807,346	56,363+	0.98+
May 31, 1912....	5,750,983	86,983+	1.52+
Apr. 30, 1912....	5,664,885	360,044+	6.97+
Mar. 31, 1912....	5,304,841	149,359—	2.79—
Feb. 29, 1912....	5,454,200	74,479+	1.38+
Jan. 31, 1912....	5,379,721	294,960+	5.71+
Dec. 31, 1911....	5,084,761	942,806+	23.24+
Nov. 30, 1911....	4,141,955	447,627+	12.06+
Oct. 31, 1911....	3,694,328	83,011+	2.25+
Sep. 30, 1911....	3,611,317	84,668—	2.34—
Aug. 31, 1911....	3,695,985	111,900+	3.33+
July 31, 1911....	3,584,085	223,027+	7.16+
June 30, 1911....	3,361,058	247,871+	7.96+
May 31, 1911....	3,113,187	105,617—	3.28—
Apr. 30, 1911....	3,218,704	228,597—	6.63—
Mar. 31, 1911....	3,447,301	46,758+	1.37+
Feb. 28, 1911....	3,400,543	289,624+	9.31+
Jan. 31, 1911....	3,110,919	436,163+	16.30+
Dec. 31, 1910....	2,674,757	85,656—	3.09—
Nov. 30, 1910....	2,760,413	111,536—	3.88—
Oct. 31, 1910....	2,871,949	286,157—	9.12—
Sep. 30, 1910....	3,159,106	379,088—	10.74—
Aug. 31, 1910....	3,537,128	433,803—	10.92—
July 31, 1910....	3,910,931	286,863—	6.72—

At the monthly meeting of the Superintendents' and Foremen's Club of Cleveland, to be held at the Pythian Temple, Saturday evening, April 18, C. S. Koch, of the Fort Pitt Steel Casting Co., McKeeeport, Pa., will read a paper entitled "Some Features of the Manufacture of Small Steel Castings".

MEN OF THE IRON TRADE

Who they are Where they are What they are doing

E. R. Neidlander has been elected president of the Aldreon Mfg. Co., St. Louis, Mo.

Gustav Hoegg, of Mount Carmel, Pa., has been made superintendent of the Weatherly Iron & Steel Co., Weatherly, Pa.

W. H. Baldridge, vice president of the Phillips Sheet & Tin Plate Co., has been elected a director of the New York Metal Exchange.

H. F. Wardwell has been appointed Chicago representative of the Monarch Steel Castings Co., Detroit, Mich. His office will be at 359 Railway Exchange building.

Walter H. Smith, formerly chief engineer and designer of the Harris Automatic Press Co., Niles, O., is now chief engineer of the Miller Saw Trimmer Co., Pittsburgh.

H. M. Ramp, who recently resigned as superintendent of the Modern Foundry Co., of Oakley, O., has been appointed general manager of the Elmwood Castings Co., Elmwood, O.

E. A. Averill, of the Railway Age Gazette, has severed his connection with that magazine to take up the duties of engineer of operation with the Standard Stoker Co., New York City.

A. P. Montague, superintendent for the past 10 years of the Lynchburg Foundry Co., Lynchburg, Va., has accepted a position as general manager of the Covington Machine Co., Covington, Va.

James M. Dickson has resigned from the sales department of the J. I. Case Threshing Machine Co., Racine, Wis., to assume the position of director of sales for the Advance Mfg. Co., Racine.

Dr. John A. Brashear, scientist and astronomer, Pittsburgh, spoke to members of the Pittsburgh Foundrymen's Association following the regular monthly dinner at the Fort Pitt hotel, April 13.

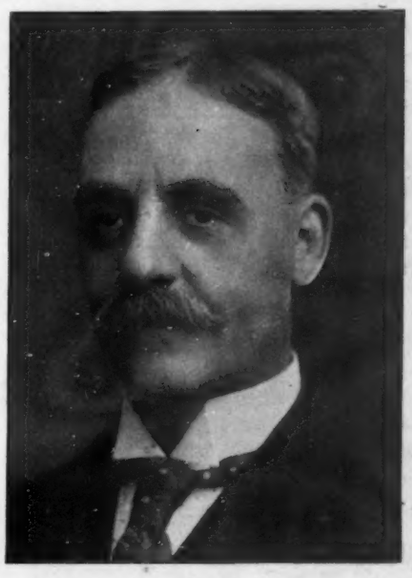
Charles M. Schwab, president and chairman of the board of directors of the Bethlehem Steel Co., South Bethlehem, Pa., will be honor guest at the annual dinner of the Americus Club of Pittsburgh, April 27, at Hotel Schenley.

J. M. Searle, former head of the bureau of smoke prevention at Pittsburgh, has opened offices at 204 Germania Bank building, that city. Mr. Searle will make a specialty of designing and constructing smokeless metallurgical and boiler furnaces.

C. L. Patterson, formerly superintendent of the H. C. Frick coke plant, at Dearth, Pa., has succeeded Robert Hogsett as superintendent of the W. J. Rainey works, at Revere, Pa. Mr. Hogsett has been transferred to the Grace plant of the Rainey interest.

W. H. Baltzell, former chief engineer of the Pittsburgh Crucible Steel Co.'s new plant at Midland, Pa., has accepted a position as consulting engineer for the Pennsylvania Steel Co., Steelton, Pa. Mr. Baltzell resigned from the Pittsburgh company Jan. 1.

Omar S. Decker, a new member of the American Iron and Steel Institute,



OMAR S. DECKER,
New Member, American Iron and Steel Institute

was born in Pittsburgh, and was educated in the schools of that city. He was auditor of the Pennsylvania Tube Works from 1880 to 1902; general sales manager of the Sligo Iron & Steel Co. from 1902 to 1909, and at the present time is doing business as a merchant in iron and steel and manufacturers' sales agent under the name of O. S. Decker & Co., with offices in the House building, Pittsburgh. He is a member of the Duquesne Club and the chamber of commerce, Pittsburgh.

John Reid Jr., New York, has been elected secretary and general manager of the Belle City Mfg. Co., Racine, Wis. The president of the company is Frank K. Bull, president of the J. I. Case Threshing Machine Co., Racine, to whom Mr. Reid is a son-in-law.

Linn Trout, steel and concrete structural engineer, has opened offices at 31 Campau boulevard, Detroit. He formerly was with Whitehead & Kales Co., the H. B. Lewis Co. and the American Bridge Co. He is an associate member of the American Association of Civil Engineers.

George W. Schuppert, Merrill, Wis., has relinquished his financial interest in the Merrill Iron Works and resigned as secretary and manager because of continued poor health. He is succeeded by H. H. Pazter, formerly associated with the concern. H. B. Richmond is president.

Capt. Grant Stephenson, general manager of the Stephenson Charcoal Iron Co., Wells, Mich., and other lumber and iron industries of northern Wisconsin and upper Michigan, has announced his candidacy for election as member of Congress from the newly created eleventh district of Michigan. His father, Isaac Stephenson, Marinette, Wis., is the present junior United States senator from Wisconsin, and is associated with Grant Stephenson in the various industries.

Harry Pollard Usher, formerly general manager of the Goulds Mfg. Co., Seneca Falls, N. Y., has been elected president of the Smith-Booth-Usher Co., Los Angeles, Cal., wholesale machinery dealer. He succeeds S. J. Smith, who is retiring from active business. Other officers elected are: Vice President, J. Roy Hoffman; secretary, J. A. Nickell; treasurer, F. P. Duncklee, formerly of the Llewellyn Iron Works; sales manager, E. H. Breidenbach, formerly of the Union Hardware & Metal Co.

H. J. Kruse has resigned his position as superintendent of the Rogers, Brown Ore Co. after six years' service with the company. Mr. Kruse did the pioneer development work for the company on the Cuyuna range, spotting the first drills, and when the Kennedy mine was started it took four-horse teams to haul the coal and machinery to the mine. The railroad came after the mine was opened. Mr. Kruse is a graduate of the Michigan School of Mines and was previously six years with the Champion Iron Co.

What's the Matter With Farmers?

Continuation of symposium on limited buying of iron and steel products

Last week the first section of the symposium of editors of agricultural papers in regard to the cause of farmers not buying implements as freely as usual this year was published. All of the 12 editors to whom a request for an expression of opinion was sent responded. Four of the letters were published last week, six are published this week and two editors requested that their letters be not published. The questions propounded were as follows:

Are imports of farm products under the new tariff interfering with the prosperity of the American farmer?

Have crop failures anything to do with the failure to buy freely?

Are uncertain prices a factor?

Is it true that farmers are sacrificing everything else in order to buy automobiles, or are there other explanations of the absence of the farmer from the market?

How long are these present conditions likely to prevail?

New Uses of Steel on the Farm

*By E S Bayard**

In reply to your recent favor, would say that we have not observed any disposition on the part of farmers in our territory to reduce their purchases of iron and steel products, nor do we know of any reason why they should do so. On the other hand, it seems to us that farmers in this territory—Ohio, Pennsylvania, West Virginia and adjoining states—are using increasing quantities of these products and will this year purchase their normal supply. If there is a decrease in the purchase of implements, wire and other metal products by farmers, we think it must be largely in sections where crops were not good last season. We have never heard of any farmer buying foreign implements and see no reason why he should do so as long as America produces the very best. We do not know what effect other importations of iron and steel products may have had.

Automobile Buyers

We do not think that automobiles are interfering with the implement trade. The man who uses the most and the best implements is usually the man who can afford to buy an automobile, and we do not think that many farmers are buying automobiles who cannot afford them.

Iron and steel products are being used in many forms unknown only a few years ago. Metal corn cribs were not known a few years back, but now they are not rare. All our silos, of whatever construction, are reinforced or stayed or hooped with steel rods. Culverts, grain bins, manure and litter carriers, feed troughs, water troughs, farm water systems, pumps, roofs, siding for buildings, reinforcement for cement construction, fences, etc., as well as implements, are calling for more of the products of your industry on our farms right along.

*Editor National Stockman, Pittsburgh, April 8.

Buying Freely in Wisconsin

*By Frank Lovejoy**

Your letter of April 2, relative to the extreme dullness which prevails at the present time in the demand for iron and steel products, is received.

We were not aware of the fact that implement manufacturers were curtailing their purchase of raw material, the implement manufacturers in Racine, for instance, are the only plants running full time.

The farmers of Wisconsin are buying implements in a greater quantity this year than they did last year. In fact, our reports from the field and the manufacturers are that Wisconsin territory has increased over 1913, and 1913, you know, for Wisconsin, was a banner year.

Of course, in the Dakotas and western territory there was a depression in the implement business owing to an extended dry season which caused universal, but only temporary, stringency.

The problem of the unemployed, as far as the manufacturer is concerned, is a big one. The employe compensation law, for instance, in Wisconsin has thrust the burden of responsibility of the employe's injury upon the manufacturer. While he is willing to assume that responsibility, he naturally reserves the right to select his workmen. This has thrust upon society a certain number of so-called incompetent help; either they are physically unfit or mentally unable to meet the requirements; these people seem to make up the principal part of the unemployed.

There is no doubt that farm products on which the duty has been removed will cause some depreciation of income to the farmer, and many are claiming that the new tariff is going to interfere materially with the farmers' welfare. But, being a little more optimistic, I think that the

(*Continued on page* 722)

*Director of Advertising, Wisconsin Agriculturist, Racine, Wis., April 6, 1914.

Making Each Square Foot Count

How the Bethlehem Steel Co. has built a 500-ton blast furnace on the site of an old 200-ton stack

By C J Stark

HOW TO PLACE and operate within the restricted ground area formerly occupied by a small stack, a large blast furnace plant of twice the capacity, was the problem that confronted the Bethlehem Steel Co., in the building at South Bethlehem of its modern new furnace *A*, now completed and ready for the blast. Many obstacles were involved in this construction because of the desire of the company to preserve the already established scheme and alignment of facilities for handling and storing materials for the whole group of furnaces. The problem was so carefully and successfully worked out that it is believed the operating area used is less than for any single furnace of similar size in the country. The skip hoist, stoves, furnace proper, dust catchers, gas washers, cast house, ladle and cinder car tracks, etc., have been designed to occupy and operate within a space of approximately 25,000 square feet. The site of the new furnace *A* is at the extreme western end of the furnace group, which occupies the most northern position in the Lehigh works of the Bethlehem company. The ground area for this stack was limited by the presence of the Lehigh Valley railroad tracks on one side and by the sets of raw material bins on the other. The building of the new furnace is part of the extensive enlargement of both iron and steel-making capacity, which has been carried on vigorously by the Bethlehem Steel Co. in recent years. With this acquisition, the present Bethlehem furnace group consists of five 22x90-foot stacks and two smaller stacks, with a combined pig iron output of approximately 1,000,000 tons annually. Notwithstanding its large melting capacity, the Bethlehem company today regards pig iron only as a by-product of its manufacturing operations, so completely has furnace gas been made the base of its power requirements for its entire manufacturing activities.

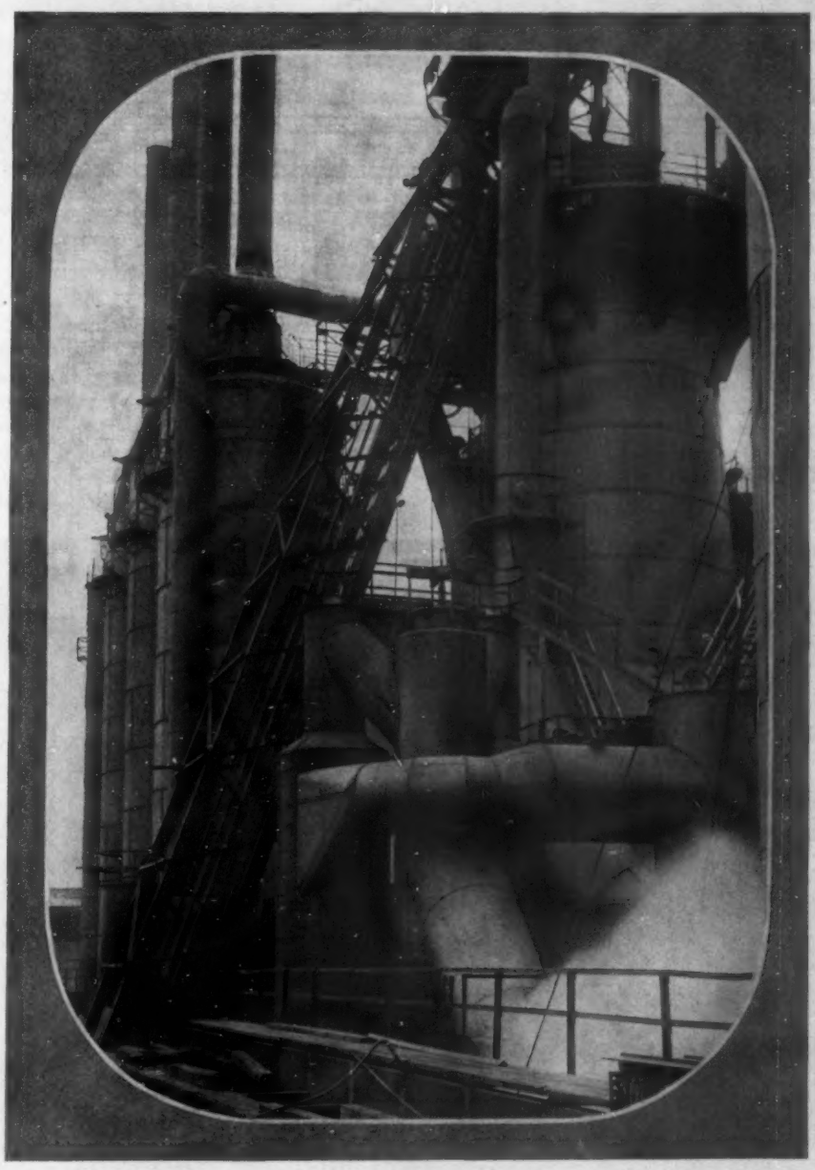


FIG. 1—NEW BETHLEHEM FURNACE FROM THE STOCK TRESTLE

Daily Capacity of Five Hundred Tons

The new furnace *A* is of the large modern closed-top type, with a rated capacity of 500 tons daily. Its dimensions are 22 feet at the bosh, 15 feet 6 inches at the hearth, 16 feet at the stock line and 90 feet in height. It replaces former furnace *A* or No. 2, which was torn down completely to make room for its successor. The dimensions of the former furnace were 18 feet bosh, 13 feet hearth, 14 feet at the stock line and 70 feet in height. Its capacity was 200 tons daily. The new furnace is of the same dimensions as furnaces *D*, *E*, *F* and *G*, which are also of recent construction. Furnace *A* is built of ¼ and ⅝-inch steel plates. On several of the large furnaces built in recent years by the Bethlehem Steel Co., bronze cooling plates were used in the bosh. In the new furnace, this plan was not followed. The bosh is constructed of ¼-inch steel plates and is completely enclosed by a skirt jacket of the Bethlehem design. This jacket is so arranged that the water, coming first from a 3-inch pipe, which encircles the bosh just above the mantle, takes a downward course and is thrown at intervals against the bosh jacket. This arrangement, it has been found, is particularly suited to

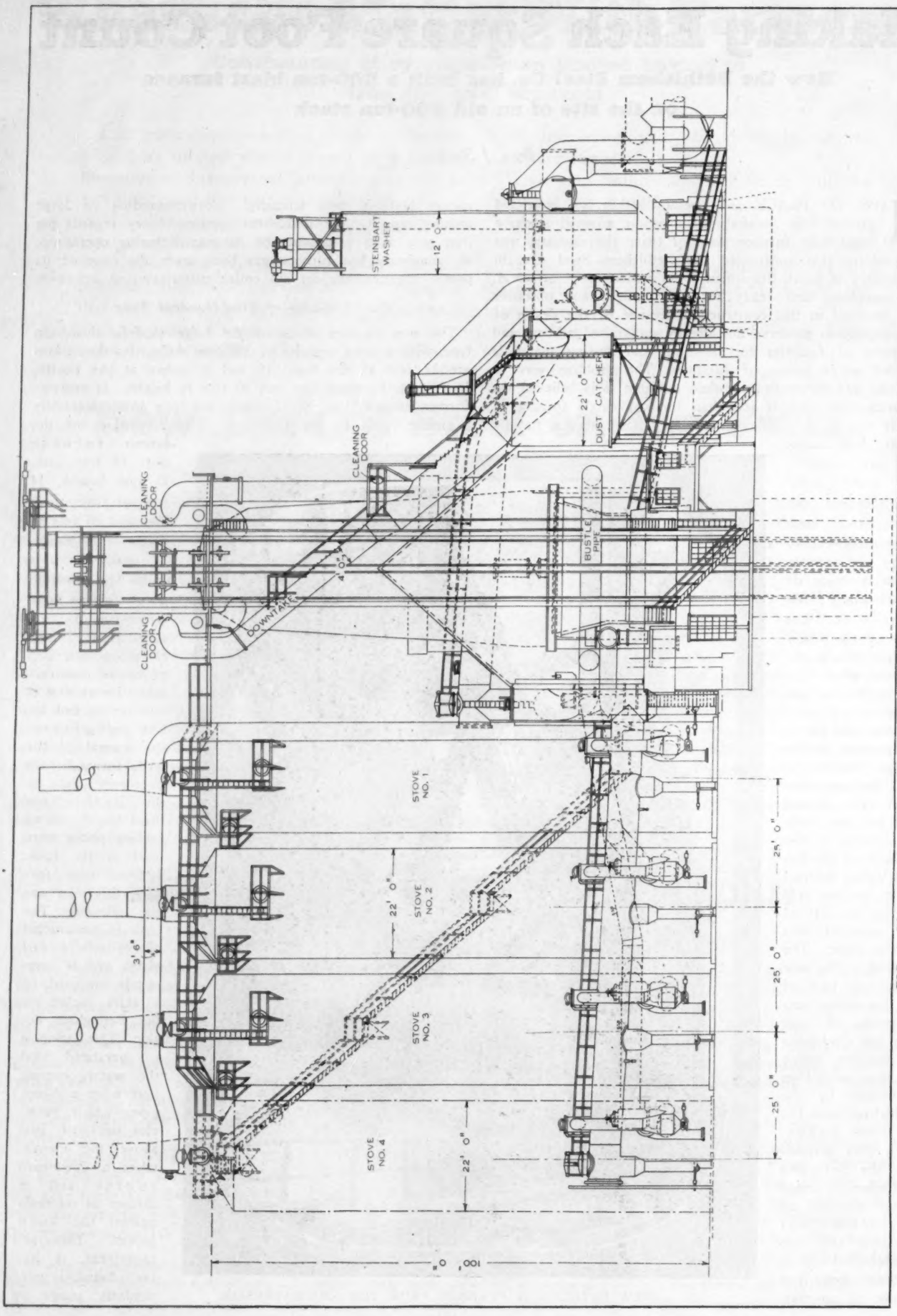


FIG. 2—ELEVATION OF NEW FURNACE, SHOWING STOVES AND STEINBART WASHER

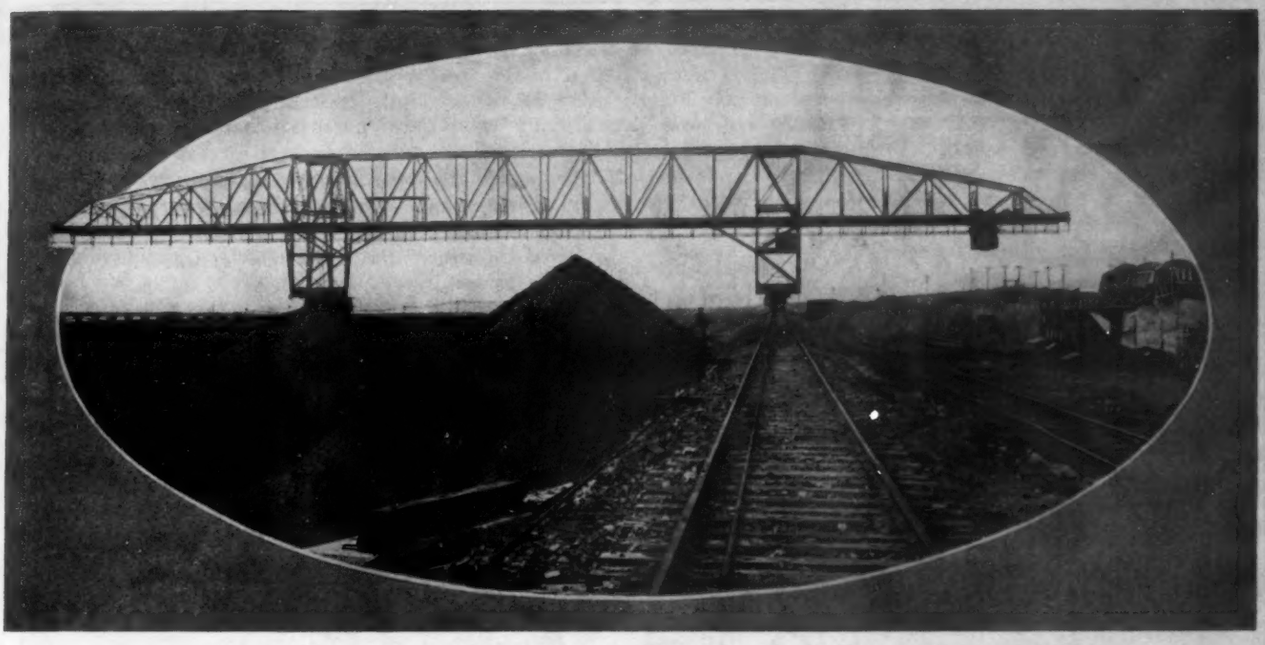


FIG. 3—VIEW OF ORE YARD, SHOWING NEW HOOVER & MASON BRIDGE AT WORK

smelting the hard ores, which are used by this company. The mantle is supported by 10 cast iron columns, each 25 feet high, 24 inches in diameter and 2½ inches thick.

Thick-Lined Stack

The stack is fitted with two downcomers, each with two branches, 4 feet inside diameter. The two main downcomers are 6 feet inside diameter above the dust catcher. Thus, there are four inlets to the downcomers and four bleeders. The downcomers connect with a dust catcher, 22 feet in inside diameter. Foundations have been built and pipe connections provided to install three Steinbart gas towers at Furnace *A*, the same as has been done at the four other large furnaces. The bustle pipe is 48 inches in diameter and is lined with 9 inches of fire brick, making an inside diameter of 30 inches. With it, are connected ten 6-inch tuyeres, the center line of which is 7 feet 6 inches above the center line of the iron notch in the hearth. Thick lining is used in the new stack, ranging from about 4 feet at the bottom to 3 feet at the top. Thin linings are not considered adaptable to the Bethlehem Co.'s practice. The stoves are five in number and of the McClure standard three-pass type, 22 feet in diameter by 100 feet in height. The stoves have individual stacks. They are heated by cleansed waste gas from the furnace.

How the Skip Problem was Solved

The construction of a skip hoist of sufficient capacity to serve the new furnace, within the restricted area available presented considerable difficulty. This question of space economy was solved by putting two breaks in the skip bridge and by changing its angularity to 70 degrees at one point and to 59 degrees in another. The upper one of the breaks in the skip bridge is shown in Fig. 5. In order to maintain the existing scale car loading facilities and

FIG. 4—NEW GAS ENGINE UNITS IN POWER HOUSE

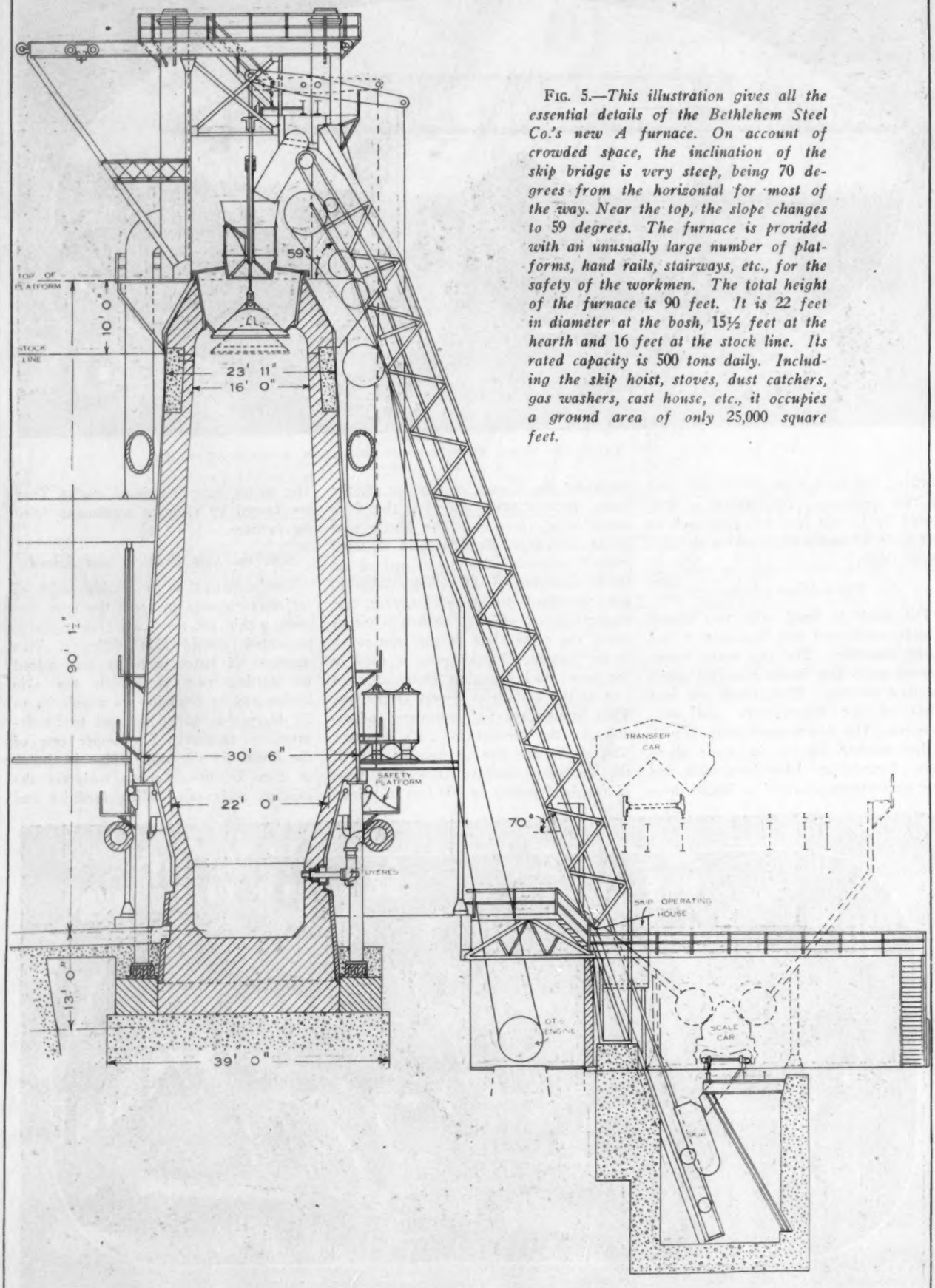


FIG. 5.—*This illustration gives all the essential details of the Bethlehem Steel Co.'s new A furnace. On account of crowded space, the inclination of the skip bridge is very steep, being 70 degrees from the horizontal for most of the way. Near the top, the slope changes to 59 degrees. The furnace is provided with an unusually large number of platforms, hand rails, stairways, etc., for the safety of the workmen. The total height of the furnace is 90 feet. It is 22 feet in diameter at the bosh, 15½ feet at the hearth and 16 feet at the stock line. Its rated capacity is 500 tons daily. Including the skip hoist, stoves, dust catchers, gas washers, cast house, etc., it occupies a ground area of only 25,000 square feet.*

to provide working space for the furnace between the bins and the Lehigh Valley railroad tracks, it was found necessary to tunnel under the end of a warehouse a distance of 12 feet. This provides the necessary space for the scale car when it stands over the skip pit to drop the furnace charge into the skip car. A view of the manner in which this excavation was made is shown by Fig. 5. The hoist is of the Otis double type, electrically operated, fitted with skip cars of 125 cubic feet capacity each.

Building the new furnace necessitated the extension of the previous auxiliary facilities of pig iron manufacture in the Bethlehem group. The capacity of the ore yard has been enlarged greatly by the addition of a second bridge of Hoover & Mason design. This bridge is fitted with a 14-ton grab bucket, electrically operated and is capable of moving 400 tons of ore an hour. It has an over-all span of 550 feet. The new machine is considerably more powerful than the one formerly installed. The ore yard is located east of the furnaces and is 550 feet wide by 1,005 feet long, with a storage capacity of approximately 1,000,000 tons.

The ore buckets from the bridges feed into electrically-operated transfer cars of 100 tons capacity, which operate over two tracks, 7 feet 10½ inches gage, laid parallel on a trestle extending from the ore yard over the furnace ore bins. The construction of furnace *A* has necessitated the extension of the trestle about 40 feet over the furnace pit. The coke and ore bins are located at the south side of the furnace and are filled by an electrically-operated transfer car. These bins are of steel plate construction and each set consists of 17 panels, 7 feet in length, their total length being 119 feet. The total capacity of each set of bins is 29,000 cubic feet of coke and 25,000 cubic feet of ore and limestone. Electric scale cars fitted with an automatic weighing mechanism, operate on tracks under the bins and receive the ore and coke charges for transfer to the skip buckets.

Heavily Built Cast House

The cast house is 110 feet long and 45 feet wide between centers of columns. It is of heavy type construction. The roof and sides are enclosed with rolled steel plates of varied thickness. The roof plates, which overlap, are 3/16-inch and the side plates are ⅜-inch thick. The purlins are placed very close together. The heavy construction of the cast house is intended to prolong the resistance of the structure against the effects of corrosion and exposure.

The casts are made into 40-ton ladle cars, which are used to transfer the metal to the mixers or to pig casting machines. The runners from the iron and cinder notches of the furnace are laid on 5 inches of fire brick and are pitched ¼-inch to the foot. The iron runners deliver on the north side of the furnace into the ladle cars. There are seven spouts, four on one side of the runner and three on the other side. Two tracks are used. Ordinarily, four ladle cars are used to receive the cast, but seven cars may be spotted under the spouts at one time and the metal distributed among them if it should be desired. The slag from the cinder notch flows through a separate runner located to the right of the iron runner and is discharged through six spouts into 20-ton cinder cars, operating on standard gage tracks at the right and paralleling the iron tracks. The cast house is equipped with a 25-ton, three-motor Alliance crane, with a span of 42 feet 2¼ inches.

The greater portion of the pig metal from the furnace group at South Bethlehem is used direct in the company's Lehigh or Saucon steel works. After the metal is delivered from 40-ton ladle cars to the mixers, it is transmitted by electric locomotives to either the Bessemer converters or to the open-hearth furnaces. Duplexing also is practiced at times on a large scale at the Saucon plant, which is located about a mile and one-half to the east of the blast furnaces. The Bethlehem Steel Co., however, is a large seller of merchant pig iron in the eastern market and this metal, together with that which is to be put into stock, is cast by machine. The pig casting equipment includes a Heyl & Patterson strand machine and a circular machine, both of which have been in operation for several years. The strand machine is shown in Fig. 6. Only a limited casting capacity is required for the reasons outlined above.

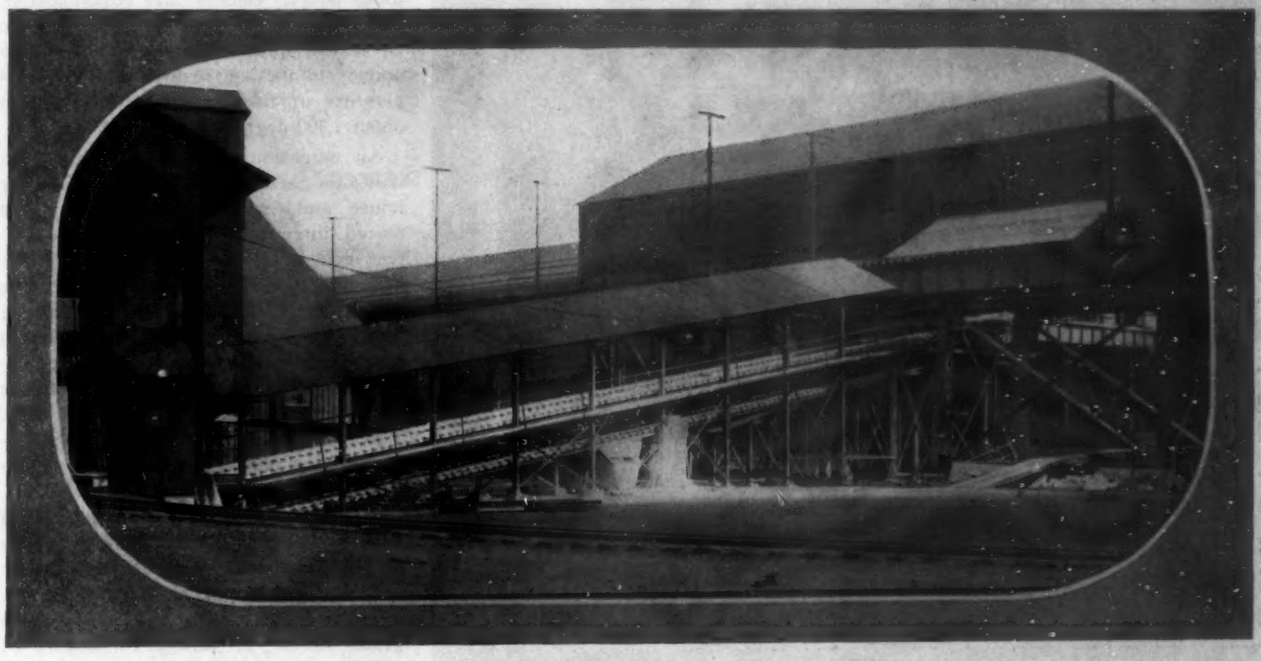


FIG. 6—HEYL AND PATTERSON PIG CASTING MACHINE

The new furnace is equipped much more thoroughly with safety devices in the way of ladders, stairs, hand railings, etc., than the average stack. These provisions against accident are part of the general activity for safety that has been pursued by the Bethlehem Steel Co. for a number of years.

Since the entire Bethlehem plant is arranged for and depends upon blast furnace gas for general power purposes, special attention is given to purifying the gas and elaborate provisions have been made so that the supply will not

be interrupted. From the furnace, the gas passes by the downcomers first to the dust catchers, from which it is led through an installation of three Steinbart or primary towers. The latter are 12 feet in diameter by 80 feet in height and are operated in parallel. At the top is a rotating spray nozzle, which throws the water on a series of concentric rings, closely spaced, called rain makers. The gas enters at the bottom, passes through the towers and out the top. Twelve Steinbart towers now are in use at the Bethlehem furnace group. These towers are connected to a general gas main, 7 feet in diameter, supplying gas to the stoves and boilers and to a central gas washing plant for the gas engines. The gas washing equipment of this latter plant includes five modified Zschocke towers and five Theisen scrubbers, the gas first passing through the towers and then through the Theisens, from which it goes to the power house through a 42-inch main.

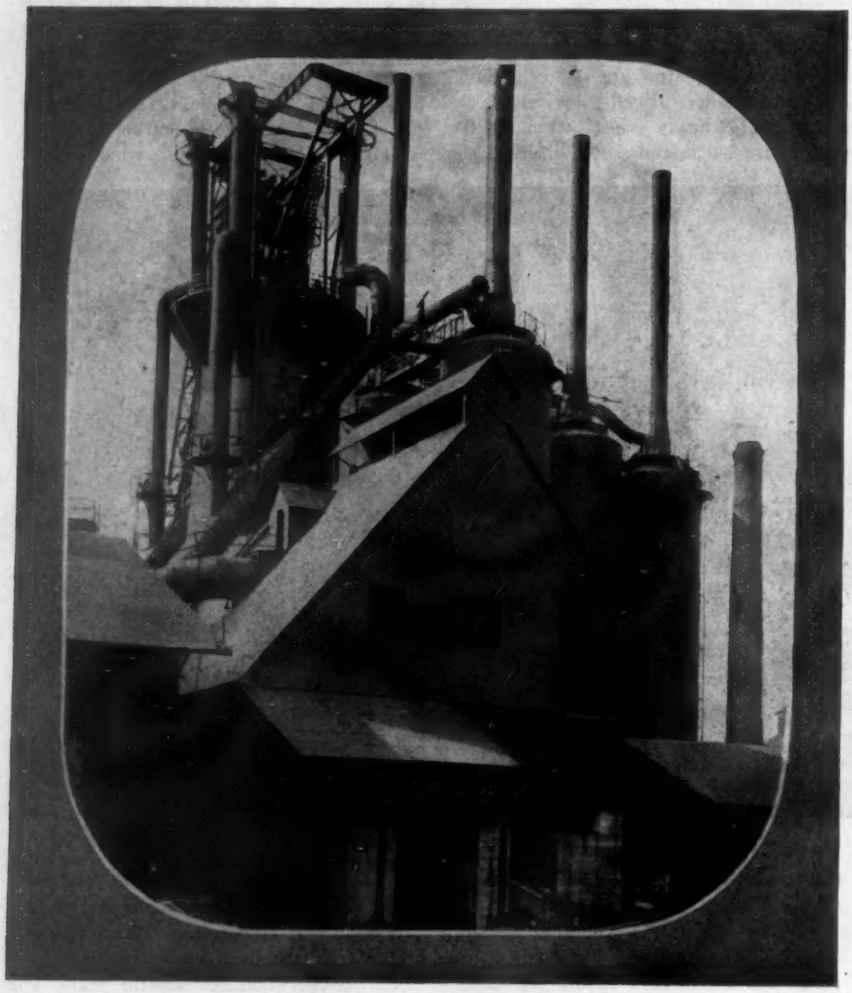


FIG. 7—CAST HOUSE SHOWING HEAVY STEEL PLATE CONSTRUCTION

It has been arranged that each furnace shall have very flexible blowing engine connections. Each of the large furnaces may be blown by any one of a majority of the gas-driven blowers and two of the largest furnaces, *A* and *D*, also may be blown by any of the Southwark steam blowing engines, Nos. 10, 11 and 12. These latter in combination with gas engine No. 17, may be used for the small furnaces, *B* and *C*.

For example, furnace *D* or furnace *E* may be blown by engines 14 to 24, inclusive, all of which are gas engines, making a total of 11 different units. Furnace *A* may be blown by steam engines, 14, 15 and 16, and gas engines, 18, 19, 20 and 21.

It is possible to blow any furnace with any of the gas-driven blowers, depending upon the number of furnaces in operation. The flexibility of the blowing system is made possible by the parallel arrangement of the cold blast mains and numerous valves, which are so placed that should an engine be out for repair, almost any blower of the group may be put into service.

New Blowing Engines

The blowing capacity of the Bethlehem furnace group has been increased by the addition of two gas-driven blowing engines, which were built by the Bethlehem Steel Co. The gas cylinders of these engines are 42 inches in diameter and the air tub has a diameter of 76 inches and a stroke of 60 inches. The engines are equipped with tubs designed by Arthur West, of the gas engine department of the Bethlehem Steel Co. They have automatic inlets and discharge valves. The design employed gives an extremely large inlet and discharge area. The valves are mounted in cages, which make them conveniently accessible. The blowing engines are of 1,800-horsepower each and deliver from 22,500 to 25,000 cubic feet of air per minute. These engines operate in regular, every-day service at 75 revolutions per minute and can be run without the slightest trouble at 85 revolutions per minute. The tubs are quiet at all speeds. About three years' experience with the first nine engines which are equipped with tubs of this class has proved them to be simple, efficient and economical in operation. The blast pressure in the Bethlehem practice averages about 16 pounds to the square inch and the temperature of the hot blast ranges up to about 1,400 degrees Fahrenheit.

An extension, 200 x 96 feet, has been built to the west end of the power house and in this extension will be placed three additional gas-driven electric generators. The building is sufficiently large for two more units to be added later. The gas engines driving these generators are of the Bethlehem Steel Co. type, twin tandem, double-acting, four-cycle, 45 x 60 inches, capable of developing 4,200 horsepower each. The generators are General Electric, 25-cycle, three-phase, 3,000-kilowatt, 6,600-volt machines. This power will be utilized at the electrically-operated rolling mills now under construction on a site at the west end of the Lehigh plant. These mills are to be devoted to the production of alloy and other high grade steels. A variety of motors of different sizes will be used for driving the roughing and finishing mills.

By means of the wide flexibility of blowing service provided for the Bethlehem furnace group, every practical contingency arising from the crippling of a furnace through the break down of engines is forestalled. The importance of this elaborate arrangement for keeping the furnace active, lies in the fact that all manufacturing in the Bethlehem works depends upon a constant supply of waste gas for power purposes and the effect of any accidental interruption would be far-reaching. In fact, as stated, the Bethlehem company regards the manufacture of pig iron as a by-product, insofar as the importance of the gas for power purposes is concerned.

The Bethlehem Steel Co. also now has work under way rebuilding furnace *C*, which greatly will increase its capacity.

This new stack is to be 18 feet at the bosh, 12 feet at the hearth, 14 feet at the stock line and 80 feet in height. Its former dimensions were: Bosh, 17 feet 6 inches; hearth, 12 feet; stock line, 14 feet, and height, 70 feet. An Otis single-type electric skip hoist counterbalanced, is being installed. A new dust catcher, two spray towers, especially designed by the company's engineers and a moisture eliminator, also are being put in. These improvements will increase the output of the furnace from about 175 tons to 250 tons of iron daily. When these improvements are completed, the furnace group of the Bethlehem Steel Co. will consist of five 22 x 90-foot stacks, one 18 x 80-foot stack, and one smaller stack, which will have a combined annual output of approximately 1,000,000 tons of pig iron. The steel work upon the new furnace *A* was handled by the Pennsylvania Engineering Works, New Castle, Pa., from designs furnished by the Bethlehem Steel Co. This same company now is engaged in rebuilding furnace *C*.

New Home for Bureau of Mines

Plans for the proposed $500,000 experiment station of the United States Bureau of Mines to be located in Pittsburgh, Pa., have been approved by the commission appointed by Congress for that purpose. The federal government now owns the property upon which will be erected a group of buildings, especially designed and adapted for the carrying on of the mine safety work and other investigation in which the bureau of mines is interested.

Congress a year ago, in the public buildings bill authorized a new home for the bureau of mines to cost $500,000. It is now expected that Congress in its present session will make a specific appropriation so that construction work may begin. It is hoped that contracts may be let by July 1. The director is hopeful that the buildings may be completed in the fall of 1915, when they will be dedicated with suitable ceremony, including a second National Mine Safety Demonstration, similar to that held at Pittsburgh in 1911.

The commission which has approved the plans consists of J. A. Holmes, director of the bureau; D. C. Kingman, chief of engineers of the United States army, and O. Wenderoth, supervising architect of the treasury. The state of Pennsylvania has appropriated $25,000 for co-operation in establishing this experiment station and has appointed a state commission consisting of James E. Roderick, chief mine inspector; Dean W. R. Crane, of the mining department, Pennsylvania State College, and W. H. Caverly. This latter commission has tentatively approved the plans.

The group consists of three main buildings facing Forbes street and the several street car lines from the uptown district. The central building of the group, the mining building, will be three stories in height, flanked by two main buildings, one the mechanical and the other the chemical building. In the rear of these and inclosing a court will be the service building. Beyond the service building and spanning what is known as Panther Hollow, and thus connecting the bureau of mines buildings with the Carnegie schools, will be two buildings over the roofs of which will pass the roadway from Forbes street to the Carnegie school buildings and Schenley park.

Between the main group and the power and fuel group will be the entrance to a series of mine shafts. One of these will be used as an elevator to carry heavy material and passengers from the lower level to the upper; another will be for tests of hoisting ropes and similar mining appliances; another will be an entrance to tunnels extending under the buildings and in which mining experiments, such as fighting mine fires, will be conducted.

The portion of Panther Hollow above the power buildings will be arranged as a miners' field, the slopes of the ravine being utilized as an amphitheater which will accommodate 20,000 spectators who may assemble here to witness demonstrations and tests in mine rescue and first-aid work. The main or mining building will contain the administrative offices and those of the mining force. In it will be an assembly and lecture hall, a library and other rooms for demonstrations and training in mine rescue and first-aid. The mechanical building will be for experiments and tests of mining machinery and appliances, and the chemical building for investigation and analyses of fuels, explosives and various mineral substances.

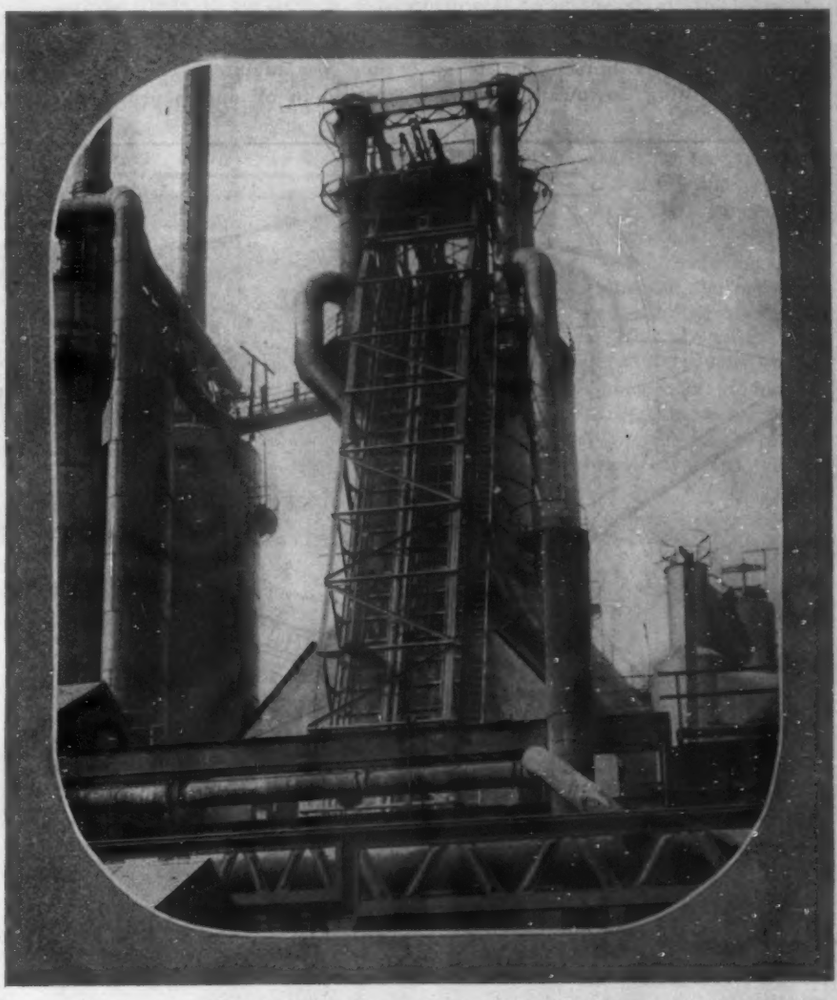


FIG. 8—SKIP HOIST AND FURNACE TOP

The buildings now used by the

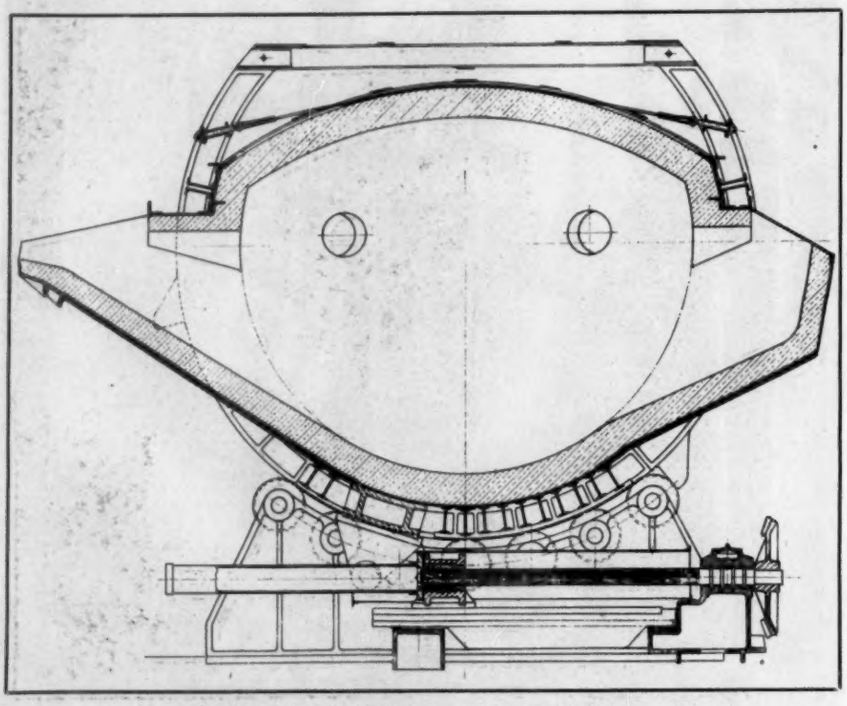
(*Continued on page 728b*)

Power Required to Tilt Mixer

In the description of the plant of the Pittsburgh Crucible Steel Co., published in THE IRON TRADE REVIEW, Nov. 6, 1913, brief reference was made to the 600-ton hot metal mixer installed by the Mesta Machine Co., Pittsburgh. Some interesting tests showing the power required to operate this mixer have been made recently, the results of which are embodied in the accompanying table. The figures indicate that 137 horsepower is necessary to start the mixer downward and 230 horsepower to start it upward. After it is in motion, a maximum of 79.4 horsepower is absorbed in tilting downward and 72.4 in tilting upward. These readings were taken with the mixer empty.

TABLE SHOWING POWER REQUIRED.

	Running.				Starting.			
Direction.	Volts.	Amp.	R. P. M. of armature.	H. P.	Time sec.	Volts.	Max. amps.	H. P.
Tilting mixer down.....	228	130	310	39.7	44	225	453	137
		260	230	79.4				
Returning mixer up.....	225	240	730	72.4	19	215	800	230



CROSS SECTION OF 600-TON MIXER

The mixer is 40 feet long, 13 feet wide and 29 feet high. The shell is constructed of 1-inch steel plates supported by a 15-inch I-beam frame. The mixer is lined with fire brick 18 inches in thickness, and there are two inspection doors on each side. The shape has been carefully considered so that the stresses are distributed in tension throughout the structure. The shell is mounted on two cast steel roller bands, which rest on 14 cast iron rollers mounted in extra heavy cast iron stands.

The arrangement of the tilting mechanism and screw is very compact, so that the clearance between the spout and the track is a minimum. The mechanism is operated by means of a triple thread screw connected through gears to two reversing motors furnished by the General Electric Co. Each motor has a rated capacity of 150 horsepower at 470 revolutions per minute. The screw is immersed in oil and is provided with a marine type thrust bearing. The motors operate on 230-volt direct current. When tilting the mixer down they are connected in series and when tilting it up they operate in parallel. The object of this arrangement is to obtain a quick return. When tilting the center of gravity of the mixer shifts. This action equalizes the power requirements in tilting and returning a full as compared with an empty mixer.

"A Daily Reminder of the Garvin Product" is the title of a 48-page booklet recently issued by the Garvin Machine Co., Spring and Varick streets, New York City. It is designed to give a general idea of the line of machinery manufactured by this company and contains just enough information regarding each product to be consistent with brevity. Each machine is illustrated, and data is included regarding its capacity and the particular kind of work to which it is adapted. The products so described include all kinds of milling machines, die slotting machines, grinding machines, hole grinding machines, duplex horizontal drills, drilling and turning machines, tapping machines, oil grooving machines, screw machines, spring coiling machines, drill presses, monitor lathes, wrenchless chucks, hand lathes, universal cutters and surface grinders, etc.

Link-Belt Data Book

The Link-Belt Co., Chicago, has recently published an engineering data book which contains information that will enable the users of power to select the correct type of silent chain drives for their work and also determine the cost from list prices shown in the book. Besides giving complete engineering information on silent chain driving in a simple and compact form, that data book, No. 125, describes many uses of silent chain for the efficient transmission of power and gives illustrations showing its application in a large variety of cases.

Silent chain as manufactured by the Link-Belt Co. consists of series of links connected by joints which contain segmental case-hardened bushings and case-hardened steel pins. Its rated efficiency is 98.2 per cent. Data from over 200,000 installations, it is understood, were drawn upon for the information contained in the book.

The book consists of 112 pages and is bound in a flexible red cover. Copies may be obtained free of charge from the Link-Belt Co., Thirty-ninth and Stewart avenue, Chicago.

J. T. Renzer, Herman Frankel, W. J. Logan, all of Mercer, Pa., and J. H. Crago, Wheeling, W. Va., have been elected directors of the Mercer Planished Steel & Iron Co., which will soon apply for a charter with $100,000 capital stock. The plant will be built in Mercer this summer.

Judson Mine to Ship This Season

Description of new property in Mastodon district of Menominee range near Crystal Falls

By M E Richards

THE Mastodon district, located in Iron County, Michigan, five miles southwest of Crystal Falls, and twelve miles southeast of Iron River, is the center of great activity in mining circles.

The district is not a new one, actual mining having been done in the year 1883, when the Mastodon and Delphic mines were opened. The Delphic mine was worked for two years, 1883 and 1884, shipping about 35,000 tons of high grade ore. The Mastodon mine worked from 1883 to 1895 and shipped 450,000 tons. In 1903 the Alpha mine was started and worked one season, shipping 2,000 tons. Recent explorations go to show that these old mines were working on the edges of one of the largest single deposits which has been discovered in recent years. In the year 1910 the Longyear interests, with whom are interested G. G. Hartley, of Duluth; Geo. F. Porter and H. H. Porter, of Chicago, the E. J. Longyear Co. and R. M. Bennett, of Minneapolis, were attracted to the district by its surrounding geological conditions, and explorations were systematically carried on for a period of three years. As a result of their efforts, there has been established the Judson mine, the Balkan mine and the McGovern, Carpenter and Goodman explorations. The late Joseph Sellwood, of Duluth, was also associated with the Longyear interests.

The Judson mine is located in the SE ¼ of NW ¼, and NE ¼ of SW ¼ of section 13, township 42 north, range 33 west, Michigan. This property is being developed by the Longyear interests with M. E. Richards as general manager. On Aug. 6, 1913, ground was broken for a five-compartment shaft, 9 feet by 19 feet 4 inches inside measurement. The shaft lies at an angle of 45 degrees and strikes northwest. The shaft is located in the footwall slates, 150 feet south of the ore body. The usual method of shaft timbering is employed, the sets being placed 5 feet apart. Washington fir timber is used, the timber having previously been creosoted.

The rate of sinking is shown in the accompanying table, the average rate to the first level being 3.16 feet per day.

Drifting for the ore was started Dec. 10, 1913, and it was encountered Jan. 7, 1914, at a distance of 177 feet northwest from the shaft; this was at the rate of 8 feet per day. The first level was opened at a vertical elevation of 200 feet, giving 75 feet of ore above. Thus, in five months time, the Judson mine was hoisting ore, having sunk the shaft 308 feet, drifted 177 feet and cut a level plat, sump and pump house. Since Jan. 7, drifting and raising in the ore has been progressing steadily, so that the Judson will rank among the producers in the season of 1914. While the first level is being developed, sinking to the second or 300-foot level is being carried on.

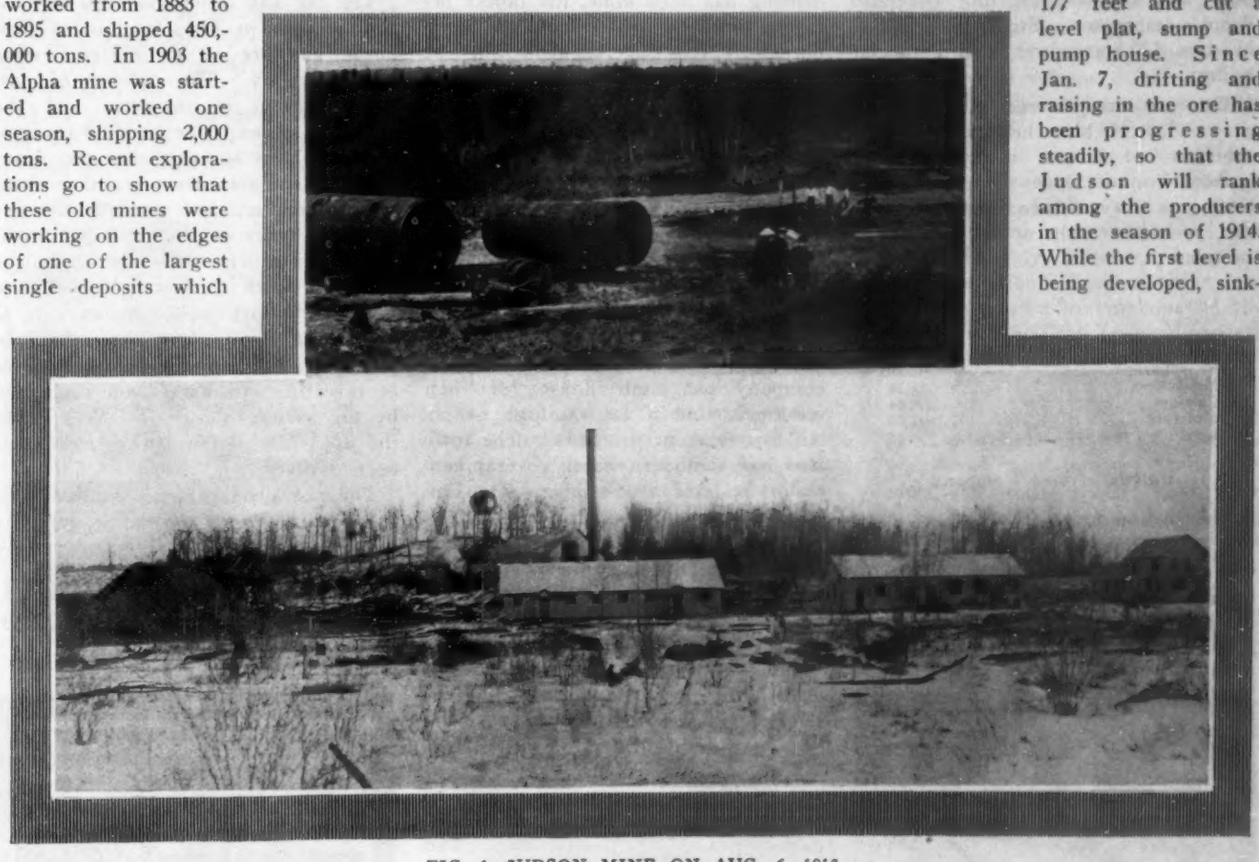


FIG. 1—JUDSON MINE ON AUG. 6, 1913
FIG. 2—JUDSON MINE JAN. 7, 1914

The Judson mine is pumping only 100 gallons of water per minute. The surface equipment consists of an engine house, 75 x 44 feet; a boiler house, 54 feet square; a dry, 85 x 34 feet; a warehouse and modern office, 30 x 75 feet, and a carpenter, machine and blacksmith shop, 120 x 30 feet. The buildings have concrete foundations and are covered by galvanized iron sheeting. The mining company has put up

General manager, Judson Mining Co., Crystal Falls, Mich.

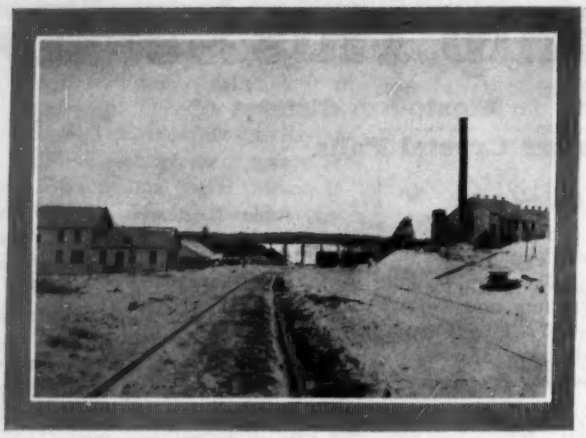


FIG. 3—JUDSON MINE FEB. 20, 1914

FIG. 4—STOCKPILES AT JUDSON MINE

a location of ten modern houses for their foremen and miners. The engine house contains a 1,200-foot Lake Shore hoist and a 2,400-cubic foot Ingersoll Rand compressor. Steam is supplied by two 120-horsepower return tubular boilers.

The ore encountered is a coarse-grained, steel blue hematite, with a moisture of 6 per cent, giving a natural iron of 53 per cent. The following is a typical complete analysis, the average result of a number of samples:

	Per cent.
Iron	57.75
Silica	4.40
Magnesia	1.90
Sulphur	0.014
Phosphorus	0.395
Manganese	0.26
Calcium	2.64
Moisture	6.00
Loss by ignition	2.18

Balkan Mining Company

The Judson Land Co. has leased the NE ¼ of NW ¼ and NE ¼ of section 13, to the Balkan Mining Co., a subsidiary company of Pickands-Mather & Co. This property contains a large deposit of high grade ore with a comparatively shallow overburden of sand and gravel. A vertical shaft, 14 x 14 feet, has been sunk and some drifting has been done, the object being to drain the water from the overburden. The overburden will be stripped and considerable of the ore will be mined by steam shovels, the remaining ore being worked by the milling system. It is the company's intention to start stripping shortly.

The Nevada Land Co., controlled by the same interests as the Judson Mining Co. and Judson Land Co., have platted a town, by the name of Alpha, adjoining the mining properties and located in the SE ¼ of SW ¼ and SW ¼ of SE ¼ of section 12. The company has built house for their workmen, and a $30,000 high school building is about completed. The town also has a modern hotel, several general stores, and a post office. The Chicago & North Western railway has built its tracks into the mines and supplies the town with excellent railroad facilities. The St. Paul railroad is contemplating extending its line into this district during the coming summer. Electrical power will be furnished the mines and town by the Peninsular Power Co., which is at present rapidly extending its transmission lines toward the Mastodon field.

FIG. 5—BUCKET CARRYING DEVICE

An error of judgment caused a loss of $700 in a metal and woodworking shop. A spark from a grinding wheel started a fire in a hopper. It was the practice in the shop to keep the sprinkler valve shut with the system full of water. Steam pressure was allowed to stand on the system and thus when a sprinkler head opened steam rather than water fed it. When it came to a test it was found that with the large vents and a steam supply of only one inch, the results were not so prompt as if the sprinkler valve had been opened and the heads fed with water.

How to Dry Clean Producer Gas

The tar and other chemical impurities present in raw, bituminous producer gas are in an extreme state of subdivision. The number of particles present is so great and the quantity of gas to be handled in commercial plants so large that the cleaning problem presents more than ordinary difficulties and the effectiveness of many types of chemical gas washers and purifiers leaves much to be desired. With a view of developing a purifier which would be capable of yielding a cleaner gas than that obtainable by ordinary methods, a series of investigations have been conducted by the writer since 1902. As a result the apparatus illustrated herewith has been evolved.

The raw producer gas is first cooled to a point where the tar vapors are condensed by passing it through a

(*Continued on page 728b*)

Abstract of paper presented by H. F. Smith at the December meeting of the American Society of Mechanical Engineers, New York.

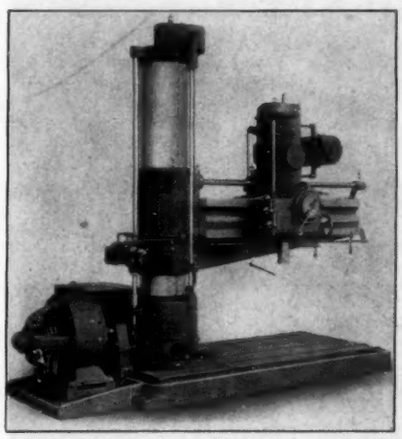
FIG. 6—JUDSON MINE SHAFT

TABLE SHOWING PROGRESS OF SHAFT SINKING

Report No.	Date From	Date To	Days worked.	Total days worked.	Feet excavated.	Total feet excavated.	Timber.	Total timber.	Kind of material cut through.	Gals. water per min.	Excav. per day on semi-monthly basis.	Excav. per day total.
1	Aug. 6	Aug. 31	14.0	14.0	45	45	43	43	Sand clay, Sandstone-Conglomerate	20	3.21	3.21
2	Sep. 1	Sept. 15	14.4	28.4	35	80	30	73	Black slate	50	2.43	2.82
3	Sep. 15	Sept. 30	13.2	41.6	40	120	43	116	Black slate	50	3.03	2.88
4	Oct. 1	Oct. 15	14.2	55.8	43	163	42	158	Black slate	60	3.03	2.94
5	Oct. 15	Oct. 31	14.4	70.2	52	215	38	196	Black slate	100	3.61	3.06
6	Nov. 1	Nov. 15	13.3	83.5	38	253	51	247	Black slate	60	2.86	3.03
7	Nov. 15	Nov. 30	13.7	97.2	55	308	40	287	Black slate	60	4.09	3.16
8	Dec. 1	Dec. 15	....	....	..	...	..	...	Black slate	75	....	....
9	Dec. 15	Dec. 31	....	....	..	...	..	...	Black slate	75	....	....
10	Jan. 1	Jan. 15	....	....	..	...	..	...	Black slate	100	....	....
11	Jan. 15	Jan. 30	....	....	..	...	..	...	Ore Ore	150	....	....
12	Feb. 1	Feb. 15	5.6	102.8	20	328	37	324	Black slate	40	3.57	3.19
13	Feb. 15	Feb. 28	10.3	113.1	25	353	23	347	Black slate	40	2.42	3.12

High Power Radial Drill

The Cincinnati Bickford Tool Co., Cincinnati, has developed a new radial drill that possesses some special features. The tool is driven by a Westinghouse adjustable speed motor with the controller mounted on the head. Compressed air is used to bind the column and lock the arm in position, the air control lever being located directly in front of the operator. The



HIGH POWER RADIAL DRILL

bearing arm swings when released under the pressure of one finger, and is arranged for rapid, easy and exact lowering and elevating. The drill handles work within the radius of a circle 12 feet in diameter and the maximum distance from the spindle to the base is 6 feet 3½ inches.

Sir Oliver Lodge, president of the British Association and principal of Birmingham University, was the principle speaker at the thirtieth annual dinner of the Junior Institute of Engineers held at London, recently. Discussing the petroleum industry, Sir Oliver Lodge said that in the future engineers will be more associated with the operations of the oil business than they have been in the past. The importance of the petroleum industry, not only to Great Britain but to all nations, is becoming more generally recognized every day.

Bailing Machine

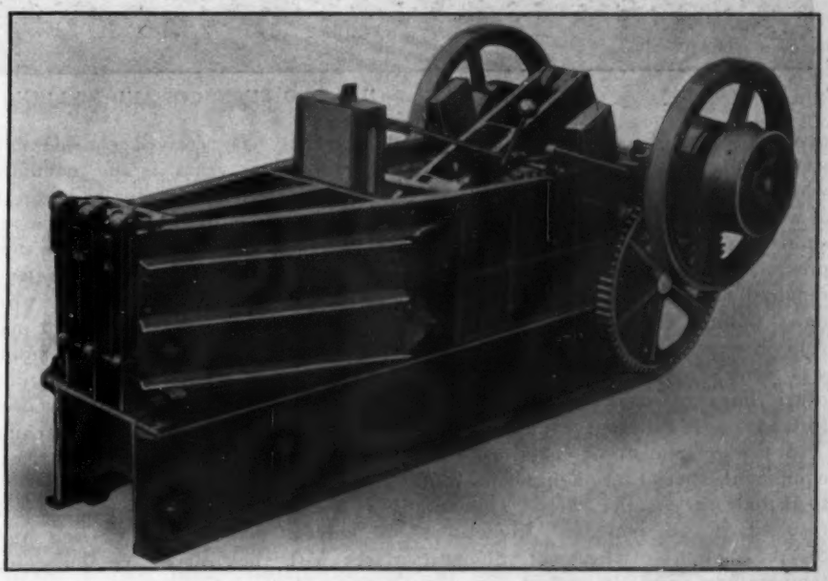
A new machine for bailing sheet metal scrap has recently been placed on the market by the Famous Mfg. Co., East Chicago, Ind. It is arranged either for belt or motor drive, a belt pulley being shown on the press illustrated herewith. The connecting rod is built of heavy steel bars and channel sections. The sides and ends of the box in which the material is pressed are built of rolled steel sections bolted together.

The machine is fitted with double back gears and a friction clutch. The bundles are so shaped that but little tieing is required to hold them together. The belt pulley is 12 inches in diameter with a 4-inch face and is designed to run from 450 to 500 revolutions per minute.

International Engineering Congress

Rapid progress is being made in working out the program of papers for the international engineering congress to be held in San Francisco in 1915. The first volume of the publications to be issued by the congress will consist of series of articles descriptive of the various technical features of the Panama canal. It will be divided into 22 chapters and will cover the design and construction of the canal thoroughly from its inception to its completion. Each of these topics will be treated by someone on the canal force who has been intimately in touch with the work.

The Caldwell Machinery Co., Tacoma, Wash., which went into the hands of a receiver in December, has been taken over by B. R. Lewis and L. L. Schauble, who have changed its name to the Sterling Machinery Co. A little additional equipment may be added.



SHEET METAL PACKER

How Shear Blades Are Made

Special facilities are necessary for cutting, forming and heat treating the steel

By R V Sawhill

SPECIALIZATION as developed during the last decade embraces not only advances in plant efficiency, but also includes improvements in the manufacture and application of the special parts of units that taken together comprise the plant itself. In the Feb. 5 issue of THE IRON TRADE REVIEW was published an interesting article on the progress made during 1913 in the application of metal-working tools. Special study has brought out refinement of manufacture and use so that while the additions last year in the way of new tools or new designs of standard machines were not many, the year as a whole showed a great advance in metal-working lines. For instance, it was shown that certain work which was previously done only on a lathe and required eight minutes, could be done on a milling machine in 35 seconds. And in some cases, the lathe in turn was found to be better adapted to other lines of work previously performed on a different type machine.

In the refinement of metal-working equipment, specialization has advanced to include the smaller parts. This has resulted in an increased knowledge of the action of heat at different temperatures and its effect on the physical structure of the steel, and a more careful attention to the chemical analysis of the metal with a corresponding increase in understanding just what elements are needed to bring out the highest efficiency in the metal part for the particular function it is to perform. And through this progress in heat-treating and carbonization, in which the pyrometer has proved to be an instrument of great value, it is now possible to make each part of a metal-working unit better adapted for its duties in both efficiency and longevity.

A branch of the metal-working industry that has received considerable study in recent years, is the manufacture of machine knives and shear blades. A plant devoted to their manufacture has just been placed in operation at Cleveland by the Cleveland Machine Knife Co. The company produces solid steel shear blades and machine knives, including planing, molding, matching, hoop, stave, jointing, paper, hog, chipper, bark and veneer knives. It also manufactures machine forgings and does commercial heat treating.

The equipment for the manufacture of knives includes six heating furnaces with their necessary quenching tanks, blowers, steam hammers, a stand of rolls, 10 large power-driven grindstones and a well-equipped machine shop.

The main building runs north and south and is 275 x 35 feet, with a bay 40 x 65 feet abutting at right angles on the west side. The latter is used as a receiving and storage department as well as for housing a part of the forge shop equipment. A smaller addition contains the power house. The buildings are of brick construction with a monitor-type roof over the forge shop.

The plant is well laid out for securing the movement of material in one general direction, thus preventing unnecessary duplication in the transport of materials. However, in a plant handling work of this character where it is necessary to machine certain parts after heating but before they are hardened, it is difficult to secure continuous movement. The forge shop, on the south, is 75 x 65 feet. Adjoining it, as shown in Fig. 2, is the grinding department, with the power house abutting on the west. The machine shop and shipping departments are next in line, with the office on the extreme north.

The raw material is received at the forge shop in the form of bars and blooms, the company using both open-hearth and crucible steel. The

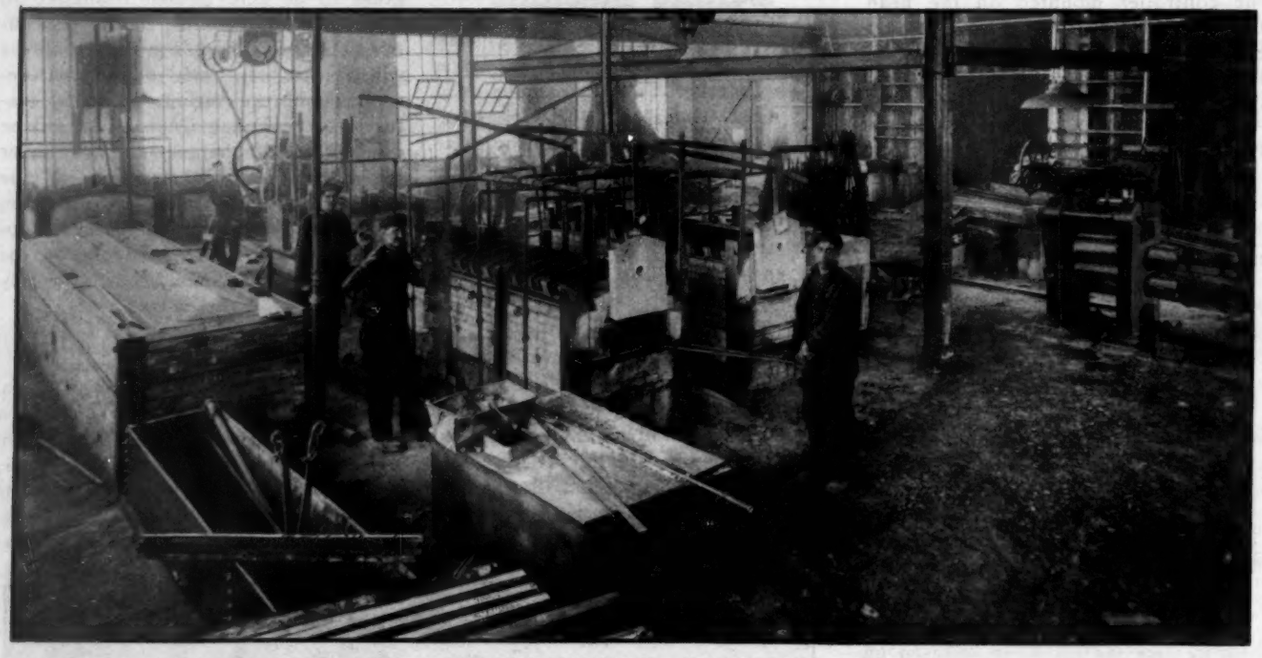


FIG. 1—HEATING FURNACES AND WELDING ROLLS

softer steel forms the back of the machine knives, while the crucible steel, tempered and hardened, becomes the cutting edge.

The strips are placed first in the two 12-foot heating furnaces, shown in Fig. 1, which, like all the others, are of brick construction, resting on a concrete foundation. The furnaces are lined with fire brick. The strips of open-hearth steel are placed in the furnace first since they require a longer time in heating because of their greater thickness and width. After they have been brought to a red heat, the narrower strips of crucible steel are placed on them and the two heated together.

When both are at a red heat, they are picked up by a small jib crane and welded together in the stand of 8-inch rolls, shown in Fig. 1. These rolls are driven by an Allis-Chalmers 60-horsepower motor and will handle strips or slabs from 1 to 1¾ inches in thickness and from 3 to 10 inches in width. Reduction down to ⅜ inch accurately can be secured if desired.

water tank for tempering shear blades. The small oil tank is used for hardening knives. A small furnace, 4 feet wide and 4 feet in length, is used for hardening and heating small parts. The high pressure blower was manufactured by the American Gas Furnace Co., Elizabeth, N. J., and furnishes the blast for all of the furnaces. It is operated in conjunction with a small blower made by the Champion Blower & Forge Co., Lancaster, Pa., which latter also drives the ventilating fan. Slotting is performed on a combination punch and shear furnished by the Cleveland Punch & Shear Works Co., Cleveland. The punch and blower are driven by a 25-horsepower General Electric motor.

The equipment for making machine forgings comprises a 1,500-pound steam hammer made by the Erie Foundry & Machine Co., Erie, Pa., and one 8-foot heating furnace for heating bars and forgings. A 500-pound Lane hammer is being installed. The material for the hammers, rolls and the six furnaces is handled by six jib

horsepower boiler, made by the Nagle Engine & Boiler Works, Erie, Pa., which also furnishes power for the hammers and heats the building. Exhaust steam from the engine is carried through pipes and radiators for heating purposes. An automatic valve on the exhaust controls the amount of steam entering the heating pipes. From the radiators, the condensed steam is led back to the power house and returned to the boiler by an automatic pump manufactured by the Platt Iron Works Co., Dayton, O.

The machine shop is placed for machining shear blades before they are hardened and for finishing other parts. It is well equipped, as shown by the following list of tools: Three power hack saw machines, manufactured by Henry B. Thompson & Son Co., New Haven, Conn.; a drill grinder from the Wilmarth & Morman Co., Grand Rapids, Mich.; a drill press from the Aurora Tool Works, Aurora, Ind.; a lathe from Schumacher & Boye, Cincinnati; a shaper from the American Tool Works Co., Cincinnati; a milling ma-

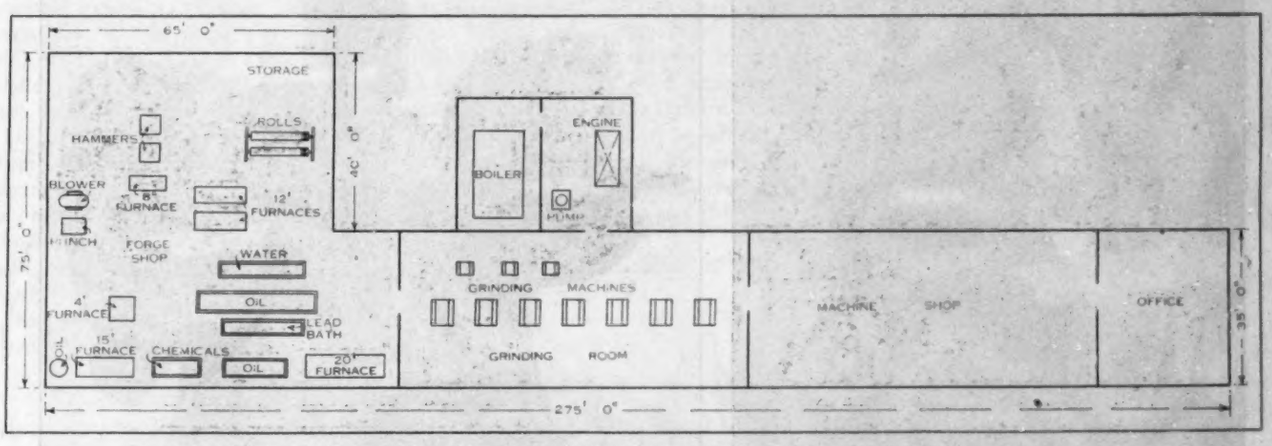


FIG. 2—LAYOUT OF PLANT OF CLEVELAND MACHINE KNIFE CO.

Subsequent heat-treating, tempering and hardening is performed in the 20 and 15-foot furnaces and by immersion in either the oil, chemical or water tank as required. The layout of the forge shop is shown in Fig. 2. Provision has been made for the installation of a lead bath to increase the company's heat-treating facilities. The 20-foot hardening and tempering furnace is one of the largest heat-treating units in operation. All of the furnaces are heated by gas. Accurate control over the temperature, which for special work will run as high as 1,800 degrees Fahr., is secured through a pyrometer installed by the Beighlee Electric Co., Cleveland.

The large oil-quenching tanks are used for drawing down steel to the desired hardness. The chemical tank is used for hardening knives, and the

cranes, operated on the pivoted I-beam trolley system. A small drop hammer is used for straightening welded strips.

The grinding department contains seven large grinding wheels and three smaller ones. The large grindstones, when received, have a diameter of 6 feet, with a 12-inch face, and weigh 4,500 pounds. The parts to be ground are held securely in a framework resting on a table, which is moved forward to bring the part in contact with the wheel. The travel of this table is controlled by a clutch operated by the workman.

Power to operate the grinders is provided through belts, connected with a 4-inch line shaft 150 feet in length, driven by a 160-horsepower compound steam engine manufactured by the Skinner Engine Co., Erie, Pa. Steam for the engine is supplied by a 150-

chine from John T. Burr & Son, Brooklyn, N. Y.; a 10-foot planer from the G. A. Gray Co., Cincinnati; a high powered drill from Baker Bros., Toledo, O.; a grinder from the Industrial Works, Philadelphia, and an 18-foot planer from the Cincinnati Planer Co., Cincinnati. The planer is of unusual size, being 34 feet over all. It is used to plane shear blades 12, 14 and 16 feet in length. The grinder has a 16-inch emery cup wheel and magnetic chucks; the latter are excited by a 7½-horsepower General Electric motor. Power for the machine shop is secured from the engine and from a 25-horsepower General Electric motor.

Special arrangements for the welfare of the employes were made by the company. Excellent light is secured throughout the day due to the large number of windows.

Safety in Grinding Wheel Work

How steel hoods can be used to advantage with suggestions for other safety measures

THE dangers of grinding wheel operation and how they may be overcome are pointed out in a bulletin recently issued by the committee on safety and sanitation of the National Founders' Association. The bulletin states that the speed of the ordinary grinding or emery wheel is as great as that of a fast express train and traveling at a rate of approximately 1 mile a minute, the wheel is subject to frequent alternations of no duty and severe duty. During one moment it may be running idle, in the next it may sustain violent shocks in rapid succession as it attacks the irregular fins of a casting or plows through a solid mass of metal.

The grinding wheels which perform this severe service are composed of a multitude of gritty particles, artificially bonded together. Manufacturers have attained remarkable results in strongly uniting these particles; the elements of the bonding process, however, cannot be controlled with such accuracy as to insure absolute safety of every wheel, and, in spite of most careful inspection and test, grinding wheels sometimes burst. Yet it must be conceded that the majority of such accidents are due to abuse of wheels in service and not to faulty manufacture.

Varied work conditions require the use of wheels of many shapes and degrees of hardness and fineness of grain. Plain wheels are obviously of stronger construction than cup wheels or other special shapes; hard wheels are of stronger composition than soft ones. Hence plain and hard wheels may be safely run at higher speeds than cup or special shaped wheels and soft grades. It has, therefore, become the custom of grinding wheel manufacturers to attach a label to each wheel, indicating the safe maximum speed of that particular shape and grade of wheel; these recommended speeds should never be exceeded.

To secure greatest efficiency of grinding wheels, it is desirable to operate them at the safe maximum speeds; most machines, therefore, are equipped with cone pulleys offering two or more speeds to equalize the wheel's cutting efficiency. The dangerous drawback of this arrangement lies in the fact that the belts on such machines may be shifted by men who do not realize the danger of overspeeding, and yet overspeeding is a frequent cause of the bursting of grinding wheels. Moreover, when a small wheel is replaced by a large one, the operative is apt to neglect to return the belt to its proper position, thereby producing an excessive, unsafe speed.

Safety devices can be installed, with comparatively small expense, to successfully overcome these hazards. On a machine equipped with a two-step cone pulley, a belt-locking device automatically controlled by the diameter of the wheel in use, as shown in Fig. 3, will take care of the problem of excessive speed as well as that of using oversize wheels. When the cone pulley has three or more steps, the belt may be secured in proper position by the belt lock shown in Fig. 4, while the use of an oversize wheel is avoided by attaching an adjustable wheel-limit stop, also shown in Fig. 3. A sign attached to the machine stating the revolutions per minute by the use of each step is of much value.

Some managers use single speed machines equipped with permanent wheel-limit stops, as shown in Fig. 3,

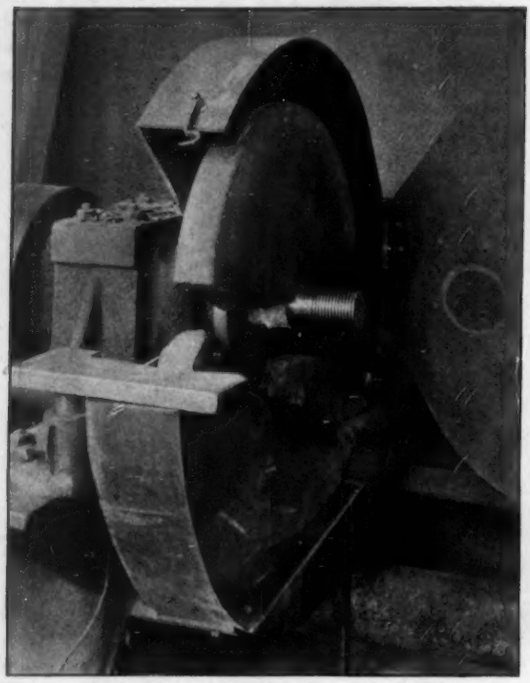


FIG. 1—PROTECTIVE VALUE OF STEEL HOOD WHEN GRINDING WHEEL BROKE

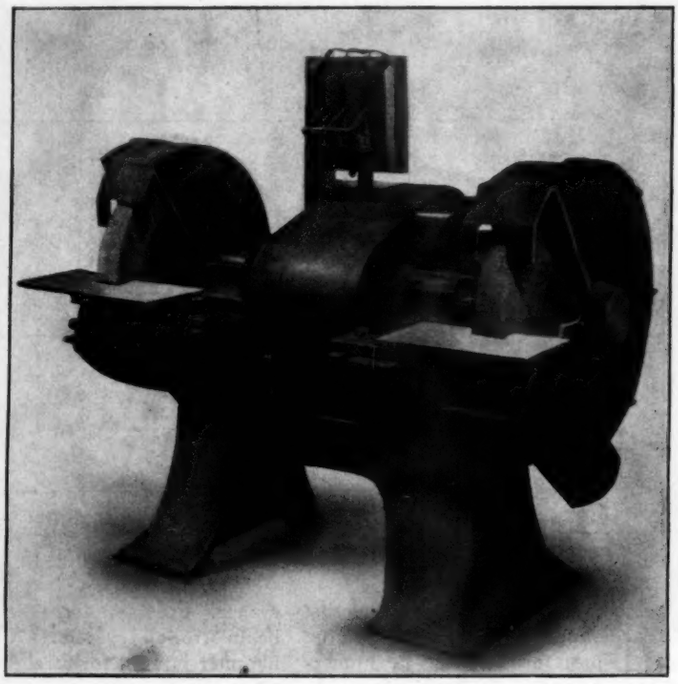


FIG. 2—MOTOR-DRIVEN GRINDER SAFEGUARDED WITH STEEL HOODS

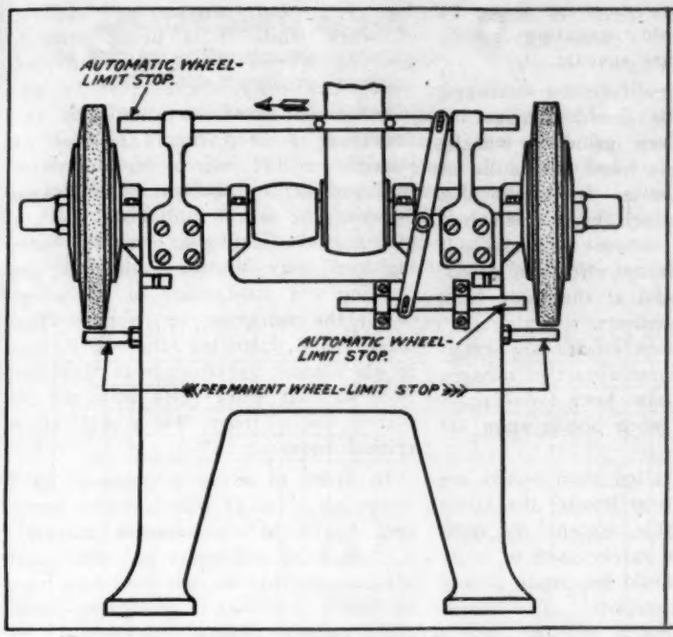


FIG. 3—BELT-DRIVEN GRINDER EQUIPPED WITH AUTOMATIC WHEEL LIMIT STOP

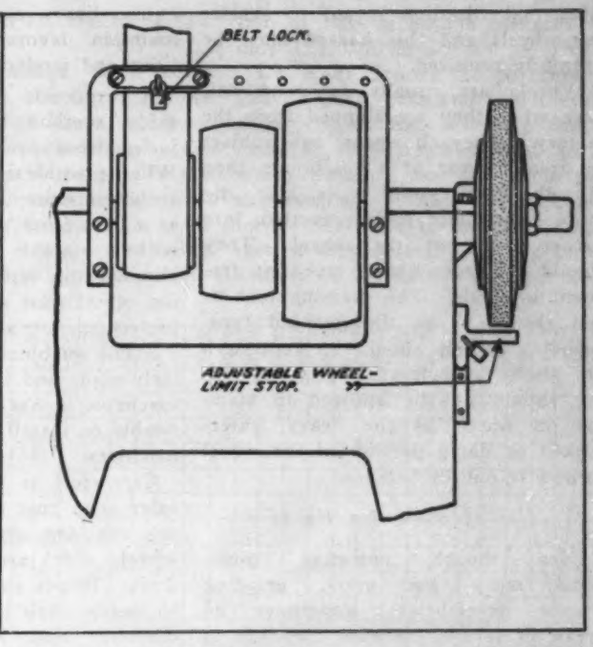


FIG. 4—GRINDER EQUIPPED WITH AN ADJUSTABLE WHEEL LIMIT STOP AND BELT LOCK

and are content to thus sacrifice efficiency in order to gain safety. In other plants, however, where a number of machines are used for one grade of work, single speed grinders, each of different speed, are used and wheel-limit stops are provided; maximum efficiency is maintained by transferring wheels successively from low to higher speed machines as the wheels wear small. When single speed machines are equipped with protection hoods of the right diameter, these limit the size of wheel used, and other wheel-limit stops are unnecessary.

Wheel Too Heavy for Spindle

When a grinding wheel is too heavy for its spindle, the latter will run out of true and may break; this may prove as disastrous as breakage of a wheel. The accompanying table gives spindle diameters which reputable grinding wheel manufacturers recommend for various sizes of wheels.

Before mounting a grinding wheel upon its spindle it is well to examine the wheel for cracks; a cracked wheel, when lightly tapped with a hammer, will not ring clear. The wheel should slide on the spindle easily, but not too loosely, as the wheel would then run out of balance; if forced on tightly, the wheel is apt to be broken. A clearance of 0.005 inch is considered satisfactory.

Excessive heating of bearings and shaft should be avoided by frequent careful adjustment and by use of automatic grease cups or self-oiling bearings, amply protected from dust and grit.

It is advisable to confine within flanges as much of the wheel as is practicable, and it has been generally agreed that wheels covered by flanges less than one-half the diameter of the wheels are unsafe; where feasible, the wheels should not be allowed to project more than 2 inches beyond the flanges, in which case several sizes of flanges are used to suit the reduced size of the wheels.

The clamping action of flanges

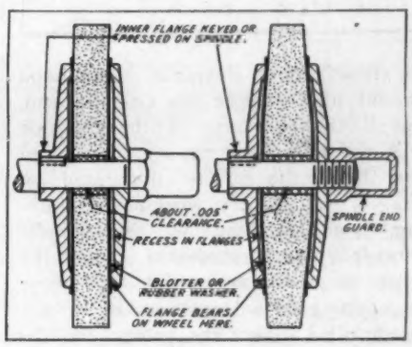

INNER FLANGE KEYED OR PRESSED ON SPINDLE.
ABOUT .005" CLEARANCE.
RECESS IN FLANGES
BLOTTER OR RUBBER WASHER.
FLANGE BEARS ON WHEEL HERE.
SPINDLE END GUARD.

FIG. 5 — PROPER MOUNTING OF STRAIGHT AND SAFETY WHEELS

should be effective at their circumference in order to compress the wheel at the outer edge of the flanges and not at the center, for which purpose the flanges should be recessed toward the center. Flanges which are not recessed clamp the wheel only where the nut compresses near the center. Steel flanges are more dependable than cast iron flanges.

Both inner and outer flanges should be of the same diameter, in order to prevent straining of the wheel. When flanges of one diameter are used exclusively, the inner flange should be pressed securely on the spindle; when flanges of various diameters are used on the same spindle interchangeably, all inner flanges should be keyed. This is necessary to provide a true bearing for the side of the wheel and to prevent a tendency of the nut to creep.

To obtain uniform pressure of flanges upon the rough sides of the wheel, washers made of soft blotting board or of 1/16-inch sheet rubber should always be used between the flanges and wheels; they should be slightly larger than the diameter of the flanges. Blotting board washers are suitable for light service; rubber washers, while a little more expensive, make better cushion contact between flanges and wheels and hold the wheel more securely.

Danger in Tight Nuts

When finally the wheel is secured upon the spindle by the clamping nut, care should be taken to tighten the latter only enough to hold the wheel firmly; otherwise the clamping strain is apt to crack the wheel.

If either the wheel or the frame of the machine should vibrate abnormally after the wheel has been thus carefully mounted upon a spindle of proper diameter, and operated at normal speed, the cause may be found in weak foundations, an unbalanced wheel, imperfect bearings or shafts, or the machine itself may be too light for the weight of the wheel it carries.

Abnormal vibration is apt to shatter the wheels and this hazard must be promptly removed.

Wheels are usually in good balance when they are shipped from the factory. They, however, are subject to greater wear at some points than at others; dressing tools also dig more deeply into soft spots than into harder parts of the wheel. They should be dressed and trued at frequent intervals. The dressing tool itself should be of the guarded type. Grinding wheels should be kept in a dry place. Wheels used for wet grinding should not be allowed to stand idle in water, as the heavy water-soaked or damp portion of the wheel throws it out of balance.

Use of Protection Hoods

Even though operating conditions may be good, grinding wheels nevertheless sometimes do break in service, because they are of brittle composition and subject to much abuse. Protection hoods, therefore, should be provided to hold within safe bounds the broken parts of a grinding wheel in case it should break; sometimes the use of safety wheels will mitigate the danger.

Safety grinding wheels usually are tapered on both sides; they are clamped between tapered steel flanges, concaved to fit snugly the tapered sides of the wheels. To insure accuracy of fit, which is very important, safety flanges and safety wheels should be furnished by the same manufacturer.

While safety wheels have prevented many injuries, they are not absolutely dependable. The unbalanced momentum of a broken wheel is often sufficient to spread the flanges and allow broken parts of the wheel to escape. Moreover, even safety flanges cannot retain broken pieces which may fly from the unconfined rim of a grinding wheel. Safety wheels are chiefly desirable in special cases when the character of the work absolutely prohibits the use of hoods, and even then extraordinary care must be taken to maintain favorable operating conditions and moderate speeds.

A protection hood is the best and safest method to guard against injuries from broken grinding wheels. When possible the hood should be of such construction as to serve also as a dust hood which, when connected with a suitable exhaust system, will eliminate the injurious effects of grinding wheel dust and at the same time protect against accidents.

Such combination hoods are regularly made and form a part of modern machines; it has also been found practicable to install such hoods upon old machines.

Cast steel or rolled steel hoods are safer than cast iron hoods; the latter are not dependable, except for light wheels which are rarely used in foundries. Hoods should be amply strong to serve their purpose. The inside diameter and width of the hoods should be sufficiently larger than the corresponding diameter of the wheel to allow proper clearance. The hood should also enclose the spindle end, but if the character of the machine will not allow this, a separate guard can be provided as illustrated in Fig. 5, to prevent workmen's clothing from catching in the spindle threads. The hood should enclose the wheel as much as possible and leave an opening only large enough to satisfactorily apply the work to be ground. If the opening is too large it will permit the escape of broken parts of the wheel and thus frustrate one important purpose for which the hood is designed; it will also require greater volume of air for proper exhaust.

Grinding dust should be carried away by an adequate exhaust system. Where this cannot be done, the eyes of operatives should be protected from the sharp and injurious grinding and metal dust by approved eye protectors. Sometimes an adjustable glass shield is used, arranged to slide in a metal frame attached to the machine.

TABLE OF SMALLEST SPINDLES FOR VARIOUS SIZES OF GRINDING WHEELS

Diameter of wheel.	Maximum Thickness of Grinding Wheels, in Inches.													
	1	1¼	1½	1¾	2	2¼	2½	3	3½	4	4½	5	5½	6
8	¾	¾	¾	¾	¾	¾	1	1	1	1	1¼	1¼	1¼	1¼
9	¾	¾	¾	¾	1	1	1	1	1	1¼	1¼	1¼	1¼	1¼
10	¾	¾	¾	1	1	1	1	1	1¼	1¼	1¼	1½	1½	1½
12	¾	1	1	1	1	1¼	1¼	1¼	1½	1½	1½	1½	1¾	1¾
14	1	1	1	1¼	1¼	1¼	1¼	1½	1½	1¾	1¾	1¾	1¾	1¾
16	1	1¼	1¼	1¼	1½	1½	1½	1¾	1¾	1¾	1¾	1¾	1¾	2
18	1¼	1¼	1¼	1½	1½	1½	1¾	1¾	1¾	1¾	2	2	2	2
20	1¼	1¼	1½	1½	1¾	1¾	1¾	1¾	1¾	2	2	2	2	2¼
22	1¼	1½	1½	1¾	1¾	1¾	1¾	2	2	2	2	2¼	2¼	2¼
24	1½	1½	1¾	1¾	1¾	1¾	2	2	2	2	2¼	2¼	2¼	2½
26	...	1¾	1¾	1¾	1¾	2	2	2	2¼	2¼	2¼	2¼	2½	3
28	...	...	1¾	1¾	2	2	2	2	2¼	2¼	2¼	2½	3	3
30	...	...	1¾	2	2	2	2	2¼	2¼	2¼	2½	3	3	...
32	...	...	2	2	2	2	2¼	2¼	2½	2½	3	3	...	...
34	...	...	2	2	2	2¼	2¼	2½	2½	3	3	...	...	...
36	...	...	2	2	2¼	2¼	2¼	2½	3	3	...	...	...	...

For safe and convenient handling of work while it is being ground, grinding wheels are usually provided with work rests; these must be adjustable and workmen should be encouraged to keep them as close as possible to the wheel, for otherwise the workmen's fingers may be drawn between the wheel and work rest or pieces of the casting or even the casting itself may become wedged in the opening and do damage to the wheel or to the workman or to both. The clamps for fastening the work rest in place must be effective in their action, so that work rests may not be forced away from the wheel at a critical moment.

In order to avoid striking of hard blows on sides of wheels when handling heavy or cumbersome castings, a chain hoist will prove an economical investment; by its use castings may be safely held while workmen guide the castings against the wheel; or suitable tables or rests can be devised for the same purpose.

Wherever belts are used on grinding wheels they should be enclosed in suitable guards constructed of sheet iron, expanded metal or heavy wire screen, attached to angle iron frames; sometimes wooden guards are used, because more economical, and, when properly made are of protective value. The belts should be guarded to a height about 7 feet above the floor.

To prevent stumbling against the machine, the floor about the machine should be kept free from castings or other obstructions.

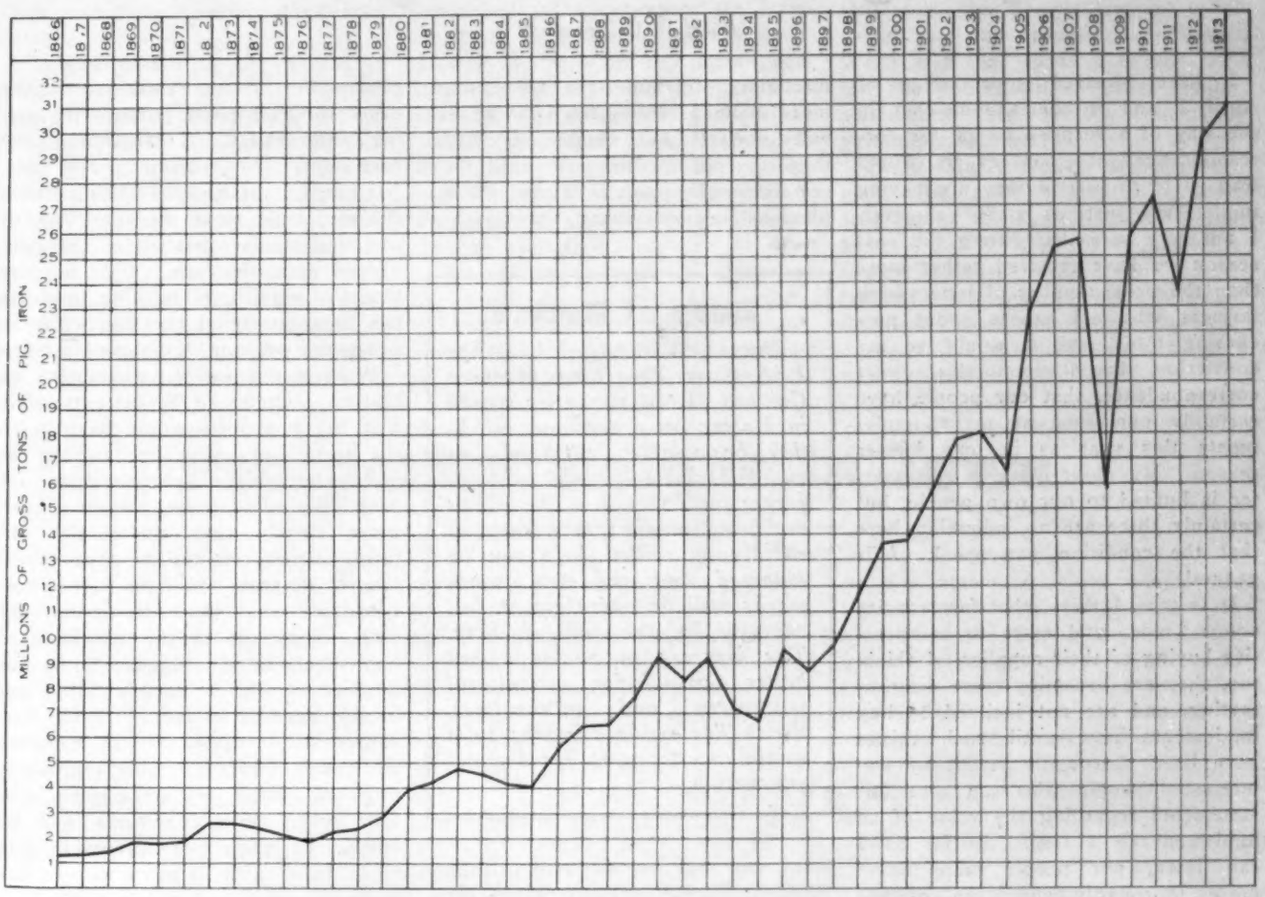
The foregoing recommendations are adaptable to machines now in use. If, however, new machines are to be installed, it is advisable to insist that they be equipped with every safeguard. Grinding machines are mostly of the belt-driven type. Electrically-driven machines are now finding increased use; they are usually equipped with constant speed motors, which, together with protection hoods and devices to limit the size of grinding wheels, give safe conditions of operation. Some manufacturers equip their machines with variable speed motors in order to maintain maximum operating efficiency; such machines should have devices to guard against overspeeding, for instance, through automatic connection between the motor speed regulator and the diameter of the grinding wheel.

In the case of portable or swing-frame grinding machines, it is equally important that all practicable protecting devices should be provided; in all cases protection hoods can be applied and provisions can be made against overspeeding.

Decreased Rate

Of Pig Iron Production Compared With Earlier Years

In THE IRON TRADE REVIEW of Jan. 10, 1907, a review of 42 years in the iron trade by Dr. William Kent was published, including a chart showing the production of pig iron from 1866 to 1906, inclusive. The chart is now reproduced, showing the production of pig iron from 1906 to Jan. 1, 1914.



TOTAL PIG IRON PRODUCTION, 1866 TO 1913.

In a paper in the *Engineering and Mining Journal*, in October, 1890, Dr. Kent made the following comment on the situation of the iron trade as it then appeared:

"Judging of the future by the past, the diagram of pig iron production would indicate that the iron trade is now at a pinnacle of prosperity from which there must be a decline in a very short time; but judging from present indications of the actual condition of the trade and of the general prosperous condition of the country, together with the low prices now prevailing, there is not the slightest indication of any decline. The present outlook is one of continued increase in production and in general prosperity."

Commenting on the above paragraph, Dr. Kent, in his article of Jan. 10, 1907, said:

"Within two months after these words were written, the Baring failure took place in England like a bolt from the clear sky, and then began a decline in prices and a depression in the trade which lasted, with a slight intermission during the short boom of 1895, for seven years, continuing through the periods of agitation concerning a lower tariff, the election of President Cleveland, the Wilson bill and the threatened advent of Byranism. Now, 16 years later, the words above quoted again may be applied to the situation, with the exception that high prices instead of low prices are now prevailing. Is another bolt from the blue in preparation, and will the history of 1907 repeat that of 1891?"

Estimates and Actualities

Another bolt certainly did come in the year 1907 and following the panic in October of that year blast furnace production sharply declined. The production up to the time of the panic had, however, been so heavy that 1907 made a new record with a production of 25,781,361 tons. Results of the panic were clearly manifested in the production of 1908, when the furnaces made only 15,936,018 tons.

Dr. Kent figured the percentage of gain of past years and said there was good reason for believing that the rate for 25 years from 1880 to 1905, which included one big panic period and two small ones, would continue for a long time to come. Using the rate of these years, 7.424 per cent per annum, or 104.742 per cent per decade, Dr. Kent gave his estimate for production up to 1920. We herewith give Dr. Kent's estimate and the actual figures of production:

Year.	Dr Kent's estimate.	Production.
1905	22,990,000	22,992,380
1906	24,700,000	25,307,191
1907	26,530,000	25,781,361
1908	28,510,000	15,936,018
1909	30,620,000	25,795,471
1910	32,900,000	27,303,567
1911	35,340,000	23,649,547
1912	37,960,000	29,726,937
1913	40,780,000	30,966,301
1914	43,810,000	.....
1915	47,070,000	.....
1916	50,560,000	.....
1917	54,320,000	.....
1918	58,350,000	.....
1919	62,680,000	.....
1920	67,340,000	.....

These figures show that production has fallen far behind Dr. Kent's estimate. The increase was only 22.36 per cent in eight years. Who will predict what the next seven years will do?

What's the Matter With Farmers?

(*Continued from page 704*)

country will probably adjust itself to a new condition and everybody prosper proportionately.

The claim that many farmers are sacrificing everything in order to buy automobiles is evidently of newspaper origin. There is no more careful purchaser than the farmer, because he has had to work up from a position of dependence to one of affluence. You will find few farmers running automobiles who cannot afford to do so.

When you ask "How long these conditions are going to last"? you have presented a "poser". If I knew this, I would gather together all the available money that I could lay my hands on and save it to buy stocks. I believe that the universal depression which seems to be extensive over the United States will not be improved much in 1914.

Adopting Labor Saving Devices

*By H W Collingwood**

I have received your letter of April 2, and it comes somewhat in the way of a surprise to us, for correspondence with our readers would lead us to think that they are buying implements just as freely as ever. I am very sure that during the past season we have received rather more than the usual number of letters from farmers who ask advice about purchasing tools, and it would be my conviction, based upon this direct correspondence, that our people have certainly purchased as many implements this year as in any former season. My observation in this matter is limited to our own people, but certainly there are no indications here that the condition you speak of is general.

It is true, I think, that farmers are coming more and more to co-operative buying of their supplies. I think, too, they are becoming more discriminating, and are not inclined to buy implements now until such things have been thoroughly tested by disinterested people who can give fair statements regarding the value of an implement or a tool. So far as I can learn, our people were never more thoroughly convinced of the necessity of employing suitable farm machinery. I think they never were more inclined to buy labor-saving devices. As I have stated, however, they are not buying now until they are thoroughly convinced that an implement is just exactly what they want, and they are disposed to follow the co-operative or communitive form of buying in quantity. I do not think that any failure of crops, or uncertain prices are any factor in this proposition; nor do I think that any large number of farmers are sacrificing other things for the purpose of buying automobiles. There may have been some foolish investment in cars, but none, I think, where the price of the car would mean the abandonment of implements that were actually needed upon the farm. I do not see that the imports of farming products can have interfered thus far with the prosperity of our American farmers.

Were it not for the quarantine on foreign potatoes, it is quite possible that heavy imports would have given the speculators a chance to depress prices, but this quarantine shuts out practically all foreign potatoes, even more closely than under the old tariff. Briefly stating the case, therefore, I do not find from our correspondence that there has been any such falling off in the purchase of implements as you suggest. I do not think there will be such a falling off in the future. In fact, I think that, with the increase of co-operative work and more favorable legislation on farm finance, we are coming to a time when farm conditions will be considered much more favorable, and when trade with farmers will be far more abundant and satisfactory. This trade, however, is, as I have stated, likely to come in a different way than formerly, and largely through co-operative or community organization.

*Editor Rural New Yorker, New York, April 4.

Busy at Racine

Racine, Wis., April 13.—The J. I. Case Threshing Machine Co. has placed its entire works in Racine on a ten-hour workday basis after enforcing an eight-hour day with reduced forces since Oct. 1. The works are being manned to normal as rapidly as skilled help can be obtained and the new south works will be operating at full capacity by the end of May. The increase in bookings and better demand for agricultural machinery and automobiles, which has reduced stocks to a minimum, accounts for the rejuvenation.

Cheaper Money is Needed

*By Alson Secor**

In reply to your inquiries concerning the slack trade in iron and steel products, would say that in my opinion the tariff has nothing to do with the purchasing power of the farmers in our territory. All Argentine raises less corn than Illinois, and if they sent it all to this country—which they will not—it would not put the corn belt states out of business or materially reduce the price—as the corn markets now show. If the price were reduced the beef raiser would be benefited, who is the greatest corn consumer.

I believe the last season's drought and floods did more to reduce the purchasing power of farmers this spring than all other causes combined. Money is tight and they are not going to buy if they can get along without. We need a cheaper and a long-time use of money. But we will not get this if the rural credit legislation is framed by the bankers—as seems to be the tendency. I can't see how uncertain prices have anything to do with the situation. The price of farm implements does not fluctuate, no matter what the times

*Editor, Successful Farming, Des Moines, Ia., April 4.

are. And no farmer is going to speculate on the price of farm crops or products next fall. He has certain things to do, certain crop rotations, and he will go ahead and take the same chance he always has to take—unless perchance the calamity howlers get in their nefarious work.

The farmers do not buy automobiles unless they have the cash to spare. The auto-owning farmers will get out and see the improvements of others and thus stimulate their own buying.

I believe that with the advent of spring conditions will improve all along the line. Nothing puts a crimp in business of all kinds like the failure of crops, or the lack of proper markets for farm products, and nothing puts life into every line of business like bright prospects for the farmers. If factories would only keep running and thus create a market for farm products, instead of shutting down and throwing the factory hands into the non-consuming class, panics would never get a look-in. The farmers are as dependent upon the buying ability of the city factory hands as the manufacturers are dependent upon the farmers for the sale of implements and things the farmers need. Whenever a factory closes its doors, it only throws sand in the gears and the machinery of prosperity does not run smoothly. The idea that a surplus might accumulate scares manufacturers out of producing, yet they expect the farmers to go on producing with the consumers too poor to buy farm products. There isn't much sale for farm products to the patrons of the bread line or free-soup kitchen. It is up to the business interests to be boosters and dispensers of optimism rather than calamity howlers, regardless of their political faith.

[Mr. Secor proceeds to denounce the sending out of boiler plate calamity news matter for political reasons, and quotes at great length interviews published in the *New York Herald* of Feb. 17 to show that business is in sound condition, that some factories are fully employed and that the prospects for the year are excellent. For example, Henry R. Towne, president of the Yale & Towne Mfg. Co., is quoted as saying: "Speaking of my own business, and the insight it gives to allied business, and my contact with business men from every part of the country, I hold, and I have steadily held for a year, the conviction that business everywhere is in a sound, safe and promising condition." We regret that space does not permit the publication of other similar statements. Mr. Secor's concluding paragraph follows:]

These sample reports are a pretty good antidote for the depressing news sent out by the Republican prosperity busters, and I wish to register my protest against misleading business reports which cannot help bringing depression upon the farmers as well as upon the manufacturing and commercial interests.

Prosperity Reigns in Iowa

*By Henry Wallace**

In answer to your favor of April 2, so far as Iowa is concerned, we are not able to see any very pronounced decrease in the demand for farm implements. While in some parts of the state we had last year a shorter crop than we often have, agriculture in the state, as a whole, is in a most flourishing condition, and our people are buying whatever they can use to advantage. West of the Missouri river, there were short crops last year and we suppose farmers in that district are buying less in the way of implements, which is wisdom on their part, if they do not have money to pay for them. As for automobiles, our people are buying them freely, but the cases are rare when the farmer deprives himself of anything to make his farm operations more profitable in order that he may purchase an automobile.

Agriculture in Iowa and the territory immediately touching it on all sides is in a most prosperous condition.

*Editor Wallaces' Farmer, Des Moines, Ia., April 6.

Remarkable Changes in Farming

*By D A Wallace**

In answer to your query concerning trade conditions in the northwest, especially with relation to the trade in iron and steel products sold in the form of agricultural implements, we infer that you base your conclusions on the national situation rather than the situation in the northwestern states. Certainly the general lassitude in this particular line of trade is not so evident in this territory as to cause general complaint. If the general crop reports of the department of agriculture for the year 1913 will be noted, the fact becomes very apparent that the northwest, including the states of Wisconsin, Minnesota, northern Iowa, the Dakotas and Montana, were given a crop condition that surpassed the conditions in all other sections of the country, this being particularly true of Wisconsin and Minnesota. Minnesota led all the western states last year in the average production per acre of corn, oats, rye and potatoes. The yield of corn, 40 bushels to the acre, was the best in the history of the state.

It is our impression that manufacturers sometimes fail to watch closely enough the general trend of agricultural development. For instance, in the northwestern states there has been in progress during the past two years a remarkable trend towards diversified farming, which has resulted in the building of a countless number of silos, the purchase of corn harvesting and planting machinery, testing material and the like. We believe it can be positively stated that the northwest is buying more live stock today, especially pure-bred stock, than any other section of the country. The director of the North Dakota experiment station estimates that they will need 1,000 pure-bred sires in that state alone this year. The local supply is entirely inadequate for the demand. The only point we wish to make is, that the manufacturer who has been expecting to sell his product to the grain-growing farmer may have to revise his merchandise

*Editor The Farmer, St. Paul Minn., April 8, 1914.

methods in dealing with the new type of farmer which is being created.

The only type of farm implements which have apparently diminished in popularity during the past year has been the large tractor, although this is a situation which will in time right itself. The facts seem to be that the original tractors were not entirely perfected and they were sold indiscriminately to farmers, many of whom were not in a position to buy these expensive machines. The banks shut down on the financing of additional purchasers, and as a result manufacturers found trade very dull last year, the fault being very largely due to the manufacturers' selling system. The real facts about the tractor in its relation to farming are now beginning to be realized and there is every indication that the business in the future will be built up along more conservative and more permanent lines.

We have heard little or no comment from farmers concerning the effect of the new tariff law. Judging from our correspondence at the time this law was under consideration it is our impression that farmers were generally favorable to it, they believing that there were compensations in other ways that would more than make up for any sacrifice which agriculture would have to pay. We have heard little or no complaints since its passage, except some of the poultry men who fear the importations of Chinese eggs.

Concerning the purchase of automobiles, there is apparently quite a demand for them among the better class of farmers, but according to our observation very few are buying machines that cannot afford them. There is a growing sentiment that an automobile on the farm is rather more of a necessity than a luxury, that it helps to banish the isolation of farm life, cuts the distance to town about in two and compensates the farm owner in a way that cannot be realized by the city owner of a machine.

Agricultural conditions in the northwest are very favorable just now. There is abundant moisture throughout this territory and the season is coming along very propitiously. Seeding will be begun at about the normal time and there is splendid opportunity for getting the soil into first class condition. All in all, the northwestern farmer faces a very bright future during 1914, if we can correctly read the signs.

TIPS FOR NEW BUSINESS

Equipment needs of the Iron and Steel works, Machine shops, Foundries and other Metal Working plants

In New York, conditions in the machinery market continue to show a slight degree of improvement, as buyers are coming in somewhat better for their requirements. Most of this buying is in small lots, but some large transactions also figure in the current volume of business. The largest purchaser of late has been the Morrow Mfg. Co., Elmira, N. Y., which has closed for machinery aggregating between $75,000 and $100,000 in value. This concern, it is understood, is still in the market. New inquiries are rather scarce. The largest is that of the C. & C. Electric & Mfg. Co., Garwood, N. J., which calls for some 50 to 60 tools. This list has not been distributed generally. There is a very good demand for second-hand machinery, but the foreign demand for American machinery continues rather slack.

In Pittsburgh, machine tool dealers continue to complain about the absence of buying, although some say there has been slight improvement in bookings the last few days. It is apparent that orders are secured only after considerable effort on the part of sellers, some of whom have succeeded in closing negotiations that were opened several months ago. Demand for heavy rolling mill equipment continues light, but the larger shops are operating at maximum schedules, not on current business, but on orders taken before the present depression hit the iron and steel trade.

In Cincinnati, a few machine tool manufacturers, including the American Tool Works Co. and the King Machine Tool Co., have booked orders recently equal to the capacity of their plants, but business with the majority of makers and dealers is unchanged and very dull. Most of the above-mentioned orders are about evenly distributed between domestic and foreign fields, but they are widely scattered. Lathes, milling machines, metal bending and woodworking machinery are the best in demand. Makers of special machinery are busy on old orders, but they have not closed many new contracts recently. Small electrical machinery is fair, and has remained unchanged for a long time. Second-hand machinery is slow and disappointing.

EASTERN STATES

BOSTON.—The Stone & Webster Corporation has secured a $2,500,000 contract from the Lachine Rapids Power Co., of Montreal, to construct a dam across the St. Lawrence just above Montreal.

MILLBURY, MASS.—An addition will be built to Cordis Mill No. 2. It will be 290 x 82, three stories. Work starts shortly and when done the firm will employ about 250 hands.

WORCESTER, MASS. — Manning, Maxwell & Moore, who have taken over the Putnam Machine Co., of Worcester, plan to build a machine shop and foundry.

HARTFORD, CONN. — Allen-Spousel Co. has been incorporated with $50,000 capital to manufacture machines for displaying advertisements.

AUBURN, R. I.—The Hope Foundry Co. is moving into its new plant next to that of the Standard Machinery Co. The large crane was set up last week and is being wired. It is hoped to be able to start operating the first of next month.

PAWTUCKET, R. I.—The Phillips Insulated Wire Works has let the contract for a brick building with power house to the Wilmarth-Maskillop Co.

ASTORIA, N. Y.—Belcha Machine Works has been incorporated; $15,000; by Andrew C. Troy, 5 Beekman street, New York City; William F. Troy and Frederick H. Schwegler.

NEW YORK CITY.—American Machine & Foundry Co. has purchased two 1-family houses at 152 and 154 Fifty-fifth street.

ALLENTOWN, PA.—The American Steel & Wire Co. plans to erect a disposal plant soon.

BERWICK, PA. — The American Car & Foundry Co. will erect a $60,000 addition to its plant here.

CONNELLSVILLE, PA. — The Bessemer Coke Co. has sold the C. C. Simmons farm in Jefferson township, including 80 acres of coal, to Holmes A. Davis, of Pittsburgh.

HARRISBURG, PA.—Work has begun on the proposed warehouse and office building for

the Emerson Brantingham Co. A machine and repair shop will also be provided.

LANCASTER, PA.—Perfect Tool Corporation has been incorporated; $300,000; by F. H. Knight, Lancaster.

MERCER, PA. — J. T. Renzer, Herman Frankel, W. J. Logan, all of Mercer, Pa., and J. H. Crago, Wheeling, W. Va., have been elected directors of the Mercer Planished Steel & Iron Co., which will soon apply for a charter with $100,000 capital stock. The plant will be built in Mercer this summer.

MOUNDSVILLE, PA.—The Sanitary Glass Milk Bottle Co. plans to erect a $50,000 brick and frame factory with corrugated iron roof. Work to start soon.

NEW CASTLE, PA.—Stockholders of the New Castle Steel & Iron Co. will meet May 27 to vote upon a proposal to increase capital stock from $400,000 to $500,000. If the increase is allowed, the plant will be equipped for the manufacture of electric welded products.

PHILADELPHIA.—White Bros., Inc., will erect a $3,500 foundry at Hedley and Carbon streets.

PHILADELPHIA. — Fire, April 1, did about $5,000 damage at the plant of the Thomas B. Skelly Bolt Co.

PITTSBURGH.—Bollinger Bros., engineers and contractors and manufacturers of mill supplies and mining machinery, have sold their plant at Newell, Pa., consisting of a seven acre site and two large mill buildings, to the Pittsburgh & Lake Erie railroad, and will erect a modern plant at Pittsburgh. The railroad, for the time being, will use the plant as a repair shop. Reports that Bollinger Bros. have decided upon a location in the Pittsburgh district are officially denied.

ROCHESTER, PA.—The plant of the Impervious Sheet Steel Co., Pittsburgh, is nearing completion, and probably will be put in operation early this summer. Charles E. Pope is president of the company.

SHARON, PA.—W. W. Shilling, president of the Sharon Foundry Co., has secured an option on the Woodward farm, Wheatland, for a manufacturing site for New York people who may erect a large manufacturing plant there.

DOVER, DEL.—The Cast Steel Pilot Co., of St. Louis, Mo., has been incorporated here to manufacture, buy, sell and deal in iron, steel, wood articles, etc.; $60,000; by Arthur T. Morrey, Oliver T. Medford, Fred Dieckman, all of St. Louis, Mo.

NEW CASTLE, DEL.—The plant of the Edgar Allen Manganese Steel Co. at New Castle, Del., was damaged by fire April 10 entailing a loss estimated at about $15,000. The blaze originated in the machine shop.

CENTRAL STATES

AKRON, O.—Sites are being considered for a $150,000 machine shop and foundry for making runner machinery. Stock is held principally by Akron and Pittsburgh people.

CINCINNATI.—Joseph B. Fey Co. has been incorporated to manufacture and deal in machinery; $10,000; by John E. Sullivan, H. L. Hobben, R. J. Hobben, J. B. Fey and F. H. Kunkel.

CINCINNATI.—The plant of the Germania Supply & Foundry Co., Covington, Ky., was slightly damaged by fire on April 9. The loss was confined mostly to the pattern shop, where about $2,000 worth of patterns were destroyed.

CINCINNATI.—The United States Can Co., Norwood, has commissioned Bert Baldwin & Co., architects, of that city, to prepare plans for a two-story brick and concrete addition to be 70 x 100 feet. No definite arrangements have been made by the company as to new equipment, but it is probable that some conveying machinery will be needed.

CINCINNATI. — Power plant equipment will be needed by the Doepke Co. for its new power house for the Chatsworth Garden group which will be built at Burnett and Rockdale avenues. It will be 44 x 57 feet and construction will be under the supervision of S. S. & G. H. Godley, architects.

CLEVELAND.—Bids will be received until April 17 at the City Hall, room 513, for miscellaneous piping for the municipal electric light plant. Special furnished blanks must be used.

CLEVELAND.—Bids will be received until noon April 21 at the city hall, room 513, for concrete mixing chambers, coagulation basins, filters and main piping outside of filters. Bids must be on prepared proposal blanks.

CLEVELAND.—Bids will be received until noon April 17 at the city hall, room 513, for cross arms for the municipal electric light plant. Proposal blanks must be obtained from commissioner of light and heat division, 1443 East Third street.

COLUMBUS, O.—Reese & Strong is the name of a firm just organized to manufacture patent core supports for molds. A 60 x 100-foot foundry will be erected soon.

DAYTON, O.—The Doty Mfg. Co. in the Calahan Power building is making arrangements to erect a $100,000 plant. It will be 80 x 120 feet, of concrete with modern equipment. The company makes vacuum sweepers. Walter G. Doty, president and general manager.

ELYRIA.—The Elyria Foundry Co. has increased its capital stock from $50,000 to $75,000.

FREMONT, O.—Fremont Steam Boiler is constructing a plant adjoining its present building.

FREMONT, O.—Improvements to the Lake Shore Electric power plant including a large brick stack to replace the present steel stack, replacing of three boilers and building a water purification plant and heating system, will be made at once.

IRONTON, O.—The Hecla Co. has been incorporated; $120,000; by A. D. Brode, F. E. Hayward, et al. to engage in mining.

KENT, O.—Falls Rivet Co. has been incorporated; manufacturing rivets; $1,000; by H. E. Andress, C. G. Wise, G. R. Notz, F. B. Burch and J. R. Adams.

LOGAN, O.—Ohio Light & Power Co. has secured the right to erect a 12-mile high tension transmission line from this town to New Straitsville. The company has franchises in several other towns in Ohio and will install a central power plant at Newark, O., Edward Wagenhals, manager, will be transferred to Newark to act as superintendent.

LOWELLVILLE.—The Meehan Boiler & Construction Co. has reduced its capital stock from $50,000 to $25,000.

MANSFIELD, O. — J. Whitford Jones, consulting engineer, recommends as part of the lighting system for this city, the installation of a $250,000 power plant.

MIAMISBURG, O.—Plans for the 2-story, 100 x 250-foot factory building for the Apple Auto Top Factory have been completed. Plans open to contractors and builders.

OAK HARBOR, O.—Bonds amounting to $16,000 will be sold April 14 for a power plant to generate and supply electricity to the city.

PAINESVILLE, O.—The cost of a high level bridge over Chagrin and Grand rivers which was discussed recently at a public meeting, was placed at $400,000.

TOLEDO, O.—The Faunce & Strong Co. has been incorporated; general hardware, roofing, furnace and sheet metal business.

ZANESVILLE, O.—The B. & O. management is considering reopening its shops here and fitting the yards for a reclaiming plant with foundry and molding shop. In that case certain buildings will be erected.

ZANESVILLE, O.—Fred C. Werner, clerk of board of commissioners, will open bids April 20 for the steel superstructure of the 752-foot bridge with 40-foot roadway and 6-foot sidewalk to be erected over the Muskingum river. Plans with county engineer.

CHARLESTON, W. VA.—The Charleston Electric Supply Co. was completely wrecked and adjoining rooms occupied by the Chas. W. Walker Storage Co. burned in a fire which broke out in the electric supply plant. Damage is estimated at $150,000.

CLARKSBURG, W. VA. — Clarksburg, Fairmont & Glenville railroad has been incorporated to build and operate a railroad from Fairmont to Glenville; M. G. Sperry and A. V. Reese are incorporators.

GRAFTON, W. VA.—The site has been purchased and plans are ready for the proposed $100,000 foundry to be erected here. O. A. Heffner, Grafton, and John H. Mayselles, of Michigan, are backing the proposition.

LOUISVILLE, KY. — John Rohringham, Inter-Southern building, is having plans drawn for a 100 x 150-foot factory building to be erected in South Louisville; to be equipped for manufacturing ice machines; will install motor-driven metal working machinery.

OWENSBORO, KY.—Bids will be received by the Municipal Light & Water department until May 10, for a 3,000-gallon turbine-driven centrifugal unit; Asa Williams, superintendent.

ANDERSON, IND.—The Big Four railroad has purchased a 7-acre tract here as a site for a round house and shop with stalls for 18 engines. A temporary shop is being equipped to take care of the work in the mean time.

JACKSONVILLE, IND.—Jacksonville Water & Light Co. has been incorporated; $70,000; by Albert H. Luhrman, A. Leberer, Frank D. Brown.

LA PORTE, IND. — The Great Western Mfg. Co. will build a drop forge plant soon. E. J. Lonn, president.

CHICAGO.—Ajax Brass Mfg. Co. has been incorporated to operate a foundry and metal manufacturing plant; $10,000; by J. F. Lockrey, 667 West Sixty-third place, A. H. Graves, 53 West Jackson Boulevard, and C. A. Soans.

EAST ST. LOUIS, ILL.—The Excelsior Tool & Machine Co. is receiving bids for an extension to its machine shop. The addition which will be fireproof, will be fitted with new machinery thus doubling the capacity of the plant; estimated cost, $10,000.

PEORIA, ILL.—Work will start at once on the 1-story and basement, 45 x 45-foot office building for the Cresent Forge & Shovel Co. W. O. Anno has the contract.

PEORIA, ILL.—Kise Electric Co. has been incorporated to manufacture a gasoline electric power outfit for farmers and householders; $50,000; at present the machine is being made at the plant of King Leigh Co., 4200 South Adams street but arrangements for erecting its own plant will be made soon.

URBANA, ILL.—Bids will be received by George C. Fairclo, county superintendent of highways, until 11 o'clock Thursday, April 16, for a bridge over Salt Fork near Sidney. Alternate bids will be received for a riveted steel truss of 165-foot span or a reinforced concrete bridge with three 55-foot spans with reinforced concrete abutments and piers.

GRAND RAPIDS, MICH.—Rempis & Gallmeyer plan to build a large brass foundry in with their iron and steel plant on Front street.

GRAND RAPIDS, MICH.—Plans and spec-

ifications for 15 concrete and steel bridges to be built by the state are on file at the Builders' and Traders' Exchange.

GRAND RAPIDS, MICH. — A $150,000 company is being organized here which will engage in the fabrication of steel. Promoters have secured an option on a desirable site.

MT. CLEMENS, MICH.—The site for the Wayne Belt Co.'s proposed plant has been secured and construction will begin at once.

SAGINAW, MICH.—The plant of the Saginaw Ladder Co. was recently damaged by fire. Loss was about $40,000.

CHIPPEWA FALLS, WIS. — Minnesota Engineering & Machinery Co. has been incorporated to do a general foundry business and manufacture the "Steady Steam Pump;" $25,000; by Fred Zieglan, T. J. Meinert, K. A. Froberg, Gustave Johnson and B. Zeigain, all of St. Paul.

MANITOWOC, WIS.—The Citizens' Association has donated two lots on South Sixteenth street to the Aluminum Goods Co. for future additions to its plant, which will soon need enlargement.

MILWAUKEE.—Koehring Machine Co. will erect a 118 x 150-foot machine shop; estimated cost, $10,000; location, Thirty-first street and Concordia avenue.

MILWAUKEE, WIS.—Siebert & Brucker, 557 Twelfth street, are making plans for a warehouse of brick, concrete and steel, six stories, 60 x 120 feet to cost about $60,000.

MILWAUKEE, WIS. — Herbst & Hupschmidt, 622 Caswell building, are making plans for a brick, concrete and steel business block, two stories, 90 x 70 feet to cost about $25,000.

PLYMOUTH, WIS. — The Kahlenberg-Klaus Co., incorporated here for $25,000 by Louis Kahlenberg, intends to establish a shop for the production of gasoline engines and general experimental work in gas engineering.

PLYMOUTH, WIS. — Deicher & Arndt, implement and machinery dealers, have changed to a corporation styled the Deicher & Arndt Co., with $50,000 capital, and will at once erect a large garage, machine shop and warehouse. Adam Deicher is president and manager.

RACINE, WIS. — The Racine Mfg. Co., metal and wood automobile and coach bodies, is having plans prepared for a $50,000 addition to its works, thus bringing the plant to the proportions of the original group which was destroyed by fire on Dec. 12, 1910.

KANSAS CITY, MO.—The Iola Portland Cement Co., of Iola, Kansas, plans to build a $1,000,000 plant here with a capacity of 2,000 barrels of Portland cement per day.

SPRINGFIELD, MO. — Hayward Wrench Co. has been incorporated to manufacture and sell automatic auto wrenches; $100,000; by Robert H. Hayward, Homer Hayward, Lewis T. Duncan, Dadeville, Mo.

ST. JOSEPH, MO.—Varner Furniture Co. has obtained a 130 x 270-foot site with Union terminal tracks in the rear. The company will start work on the proposed 90 x 170-foot, 2-story brick and tile building about April 15. H. C. Varner is president.

HAMPTON, IA. — Hampton Foundry & Machine Co. last week assigned the property to N. W. Beebe, who will represent the company at the coming term of court. The plant will probably have to be sold.

FAIRMONT, MINN.—The Fairmont Machine Co., F. E. Wade, manager, has let a contract for a machine shop 80 x 300 feet, two stories, to cost $35,000.

MINNEAPOLIS, MINN.—Kienzle & Merick Mfg. Co., 1214 Third street south, has let the contract for its proposed plant to W. H. Arrell & Co. The company makes brass and iron goods.

SOUTHERN STATES

NORFOLK, VA.—Norfolk Machine Works has been incorporated; $25,000; by A. T. Cathey, president; J. G. Grubb, secretary.

NORFOLK, VA. — Portsmouth Machine Works is installing a plant here for doing heavy and light machine work, making castings and gasoline engine repairs; president, A E. Holland; secretary and treasurer, George A. Flagg; manager, J. C. Flagg.

RICHMOND, VA.—Old Dominion Iron & Nail Works Co. is rearranging the location of its rolling mills at Belle Isle in order to operate them by electric motor; cost, about $50,000.

STAUNTON, VA. — Warren Machine & Tool Co. has been incorporated; $1,000 to $5,000; by T. N. Durham, president; F. J. Lyons, secretary; both of Warren, Pa.

BOONE, N. C. — Appalachian Training School plans for a dam and electric light plant to develop 175 to 200-horsepower; will construct a 2-mile transmission line, 3-phase, 2,200-volt; also 15-foot frame dam and 15 x 30-foot concrete and brick power house; cost about $6,000; bids opened April 15.

TAMPA, FLA.—Tampa Foundry & Machine Works will erect a 1-story, 50 x 60-foot steel and wood addition to its plant; cost about $12,000.

BESSEMER, ALA.—The Superior Foundry Co. which considered a location in Birmingham, Ala., has broken ground at Bessemer for its $65,000 plant. Officers are as follows: President, Wiley Alford; vice president, W. C. Martin; secretary and treasurer, M. Shook; manager, John Birdwell.

BIRMINGHAM, ALA. — Beggs Mfg. Co., recently organized and chartered here, has taken over the old stove works at Queenstown and will convert it into a soil pipe factory.

BIRMINGHAM, ALA.—Morrison Frogless Switch Co. will open bids June 15 for a 100 x 250-foot steel and concrete building, also machinery. The plant will be erected at Tuscaloosa.

EAST BIRMINGHAM, ALA.—Fire did about $80,000 damage recently to the plant of the Stockman Pipe & Fitting Co.

CHATTANOOGA, TENN. — Converse Bridge & Steel Co. has been incorporated; $10,000; by R. O. Banner, O. J. Cape, M. C. Hasselle, J. Whilhoite and F. Giddings.

CHATTANOOGA, TENN.—The Cincinnati, New Orleans & Texas Pacific Railway Co. will build a $100,000 car plant at Chattanooga; construction to start within the next two weeks.

KNOXVILLE, TENN. — Southern Valve Gear Co. has been incorporated to manufacture a patent valve; $300,000; William S. Brown, an engineer on the Southern Railway, is the inventor.

NASHVILLE, TENN. — International Wheel Co., maker of auto wheels, was recently organized with $100,000 capital. Officers: President, Alex Haas; vice president, H. A. Cohen; second vice president, Dave Bogatzby; secretary, Louis Cohen; treasurer, Joe Fisher. It will erect a factory here later.

GUTHRIE, OKLA.—James E. Oliver has purchased a site adjoining the Southwestern Iron Works and may erect a canning factory.

WESTERN STATES

KANSAS CITY, KAS.—The Kansas City Malleable Iron Co. is building a malleable iron foundry one story, 70 x 200 feet. Geo. Bemackt, 1501 West Third street is in charge.

GLENDIVE, MONT.—The Glendive Heat, Light & Power Co. will increase its capital stock by $65,000 in order to extend and improve its plant.

HARDIN, MONT.—Big Horn Irrigation & Power Co. will let a contract about July 1 for 70 miles of railroad construction and a 600-foot bridge over Big Horn river; John J. Harris, president.

SHANNON, IDA.—Salmon River Power & Light Co. has been incorporated to develop power near here; $400,000; by H. H. Boomer, Spokane, Wash.; C. L. McKenzie, Colfax, Wash., et al.

VERNON, CAL. — The American Brake Shoe Co. will let contracts at once for its proposed $300,000 branch plant to be erected here about May 1.

TRADE NOTES

CHICAGO.—Pratt & Cady Co., Inc., announces it has taken over the entire business of the Pratt & Cady Co. There will be some change in the personnel of the organization and the same line of valves, cocks and hydrants will be continued.

ELYRIA, O.—The Elyria Foundry Co. has increased its capital stock from $50,000 to $75,000.

EVANSVILLE, IND.—The Anderson Wire & Steel Co. has moved from Anderson to Evansville, Ind., where it will operate under the name of the Shimer Wire & Steel Co.

LOWELLVILLE, O.—The Meehan Boiler & Construction Co. has reduced its capital stock from $50,000 to $25,000.

NEW CASTLE, PA. — The New Castle Iron & Steel Co. has called a stockholders' meeting for May 27 to vote on increasing the capital stock from $400,000 to $550,000. Directors consider increasing the activity of the company and branching into new fields.

PITTSBURGH.—The Mesta Machine Co. has recently received an order from the Cambria Steel Co. for a 48-inch cold saw. The saw will weigh approximately 50,000 pounds and will be adaptable for cutting steel sections from the smallest size up to 24 inch I beams. The saw will be driven by 150 horsepower Westinghouse motor and will run at peripheral speed of 22,600 feet per minute with a cutting speed of 1 inch per second.

RICHMOND, IND.—The Reliance Foundry Co. has been reorganized. George L. Shultz retired as treasurer, vice president J. E. Jones taking up his duties. Edward I. Hunt is president and Howard C. Hunt, secretary.

ST. JOHNSBURY, VT.—The E. & T. Fairbanks Co., manufacturer of Fairbanks scales, has been obliged to pass dividend on its $2,500,000 stock because of unsettled business conditions. The company was formed in 1874 with main plant here and subsidiary plants at Moline, Ill., and Terre Haute, Ind.

SCHENECTADY, N. Y.—Among the orders recently taken by the General Electric Co. are the following: The Pennsylvania Steel Co., Philadelphia, a 450-kilovolt-ampere regulating set, 600-horsepower induction motor and switchboard for mills at Steelton, Pa.; Detroit Seamless Steel Tube Co., Detroit, two 300-horsepower induction motors; Indiana Steel Co., Chicago, 27 15-horsepower induction motors; Worcester Pressed Steel Co., Worcester, Mass., three 300-kilovolt-ampere transformers and one 500-horsepower induction motor; American Iron & Steel Mfg. Co., Lebanon, Pa., one 4,000-kilovolt-ampere 2-unit, 3-bearing motor generator set with combined exciter and blower set; John Wood Mfg. Co., Conshohocken, Pa., two 200-kilowatt rotary converters, four 110-kilovolt-ampere transformer and a switchboard; Jeanesville Iron Works Co., Hazelton, Pa., three 200-horsepower induction motors with compensators.

SOUTH MILWAUKEE, WIS.—The Line Materials Co., manufacturing goods and supplies for outside electrical work, which was organized in 1911 and has until now occupied part of the Stowell Mfg. & Foundry Co.'s plant here, has purchased the former Hansen

box factory plant and is remodeling it for its own occupancy. The new quarters will enable the concern to more than double its output. The officers of the company are: President, Frederick L. Sivyer, Milwaukee; vice president, L. E. Hendee, Milwaukee; secretary, T. E. Ward Jr., South Milwaukee; treasurer, W. D. Kyle, Milwaukee. Mr. Kyle is general manager.

TOLEDO, O.—The France Slag Co. has increased its capital stock from $50,000 to $250,000. The company owns plants here, at Detroit, Canal Dover and Leetonia, all utilizing slag from the plant of the Toledo Furnace Co.

WARSAW, N. Y.—The Warsaw-Wilkinson Co., which operates the former Bidwell factory in Batavia as the Batavia Machine Co., has formed a separate company in Warsaw to be known as the Warsaw Construction Co. to take care of concrete and steel construction work. The old firm at Warsaw makes agricultural implements.

New Trade Publications

WELDING AND CUTTING PLANTS.—A catalog recently issued by Waterhouse Welding Co., Boston, describes and illustrates various types of portable oxy-acetylene welding and cutting equipment. Detailed price lists are also included in the booklet. It contains 16 pages.

TOOL GRINDERS.—The Stow Mfg. Co., Binghamton, N. Y., has recently issued a number of loose leaf bulletins describing various kinds of tool grinders. Both post and hand grinders are fully described and illustrated, together with bench grinders, boring machines, etc.

BALL THRUST BEARINGS. — Bulletin No. 104, issued by the Norma Co., 20-24 Vesey street, New York, contains illustrations and detailed specifications of numerous ball thrust bearings suitable for machine tools, shafts, motor cars, etc. The booklet contains 24, 6 x 9-inch pages.

FANS AND BLOWERS.—Catalog No. 3 issued by the Clarage Foundry & Mfg. Co., Kalamazoo, Mich., contains illustrations and detail specifications of various types of ventilating fans. The first pages of the catalog contain a detailed description of the construction of the fan casings, bearings, etc.

ELEVATORS. — Whiting Foundry Equipment Co., Harvey, Ill., has issued a new catalog describing its extensive line of foundry and factory elevators driven by compressed air, electricity, or from line shafts. Typical elevator installations are illustrated in the booklet which contains 12 pages.

COAL DRILLS.—A 12-page bulletin recently issued by the Chicago Pneumatic Tool Co., Chicago, describes various electric driven coal drills. The text, which includes complete descriptions and specifications, is supplemented by numerous illustrations. List prices are also quoted.

BRASS FOUNDRY EQUIPMENT. — The Whiting Foundry Equipment Co., Harvey, Ill., has issued a new 8-page bulletin describing its brass foundry equipment. This includes both stationary and tilting furnaces, tumblers, tongs, ladles, ladle shanks, etc. The new catalog, known as No. 108, supercedes catalog No. 191.

PYROMETERS.—The Uehling Instrument Co., Passaic, N. J., has issued a new catalog describing its line of pyrometers. The booklet contains 18 pages, and includes some valuable data regarding pyrometer practice. On the front cover is a reproduction of a 24-hour chart made by a triple recording instrument.

ENGINE TYPE GENERATORS.—Bulletin No. 121-I, issued by the Crocker Wheeler Co., Ampere, N. J., contains some interesting data covering a new line of electric generators designed for direct connection to steam engines. The various features of these machines are fully described and illustrated in the booklet which contains eight 7½ x 10-inch pages.

STEAM TURBINES.—Return flow steam turbines of the new type are described in a bulletin recently issued by the Terry Steam Turbine Co., Hartford, Conn. In the Terry turbine it is said that the leakage of air to the condenser has been eliminated. This type of machine has many other features which are fully described and illustrated in the bulletin.

LOCOMOTIVE CRANES.—Bulletin No. 30 issued by the McMyler Interstate Co., Cleveland, fully describes and illustrates a new standard gage locomotive crane, which has been placed on the market by this concern. These cranes are fitted with booms of any length up to 70 feet, and have a lifting capacity with outriggers ranging from 8,000 to 70,000 pounds.

MEASURING INSTRUMENTS. — The Norma Co., of America, 20-24 Vesey street, New York, has issued a four-page bulletin describing an interesting instrument for making accurate measurements of machine parts. This device, which is known as a minimeter, is designed to enable the measurement of machine parts to within a limit of error of 1-10,000 millimeter.

BRASS FOUNDRY EQUIPMENT. — An unusually complete, 56-page bulletin has recently been issued by J. W. Paxson Co., Philadelphia, describing a full line of brass foundry equipment, including melting furnaces, ladles, flasks, jackets, facings, riddles, magnetic separators, etc., etc. The various machines are fully and carefully illustrated with half-tones and drawings.

MOLDING MACHINES.—The S. Freeman & Sons Mfg. Co., Racine, Wis., has issued a catalog, describing its line of Dearsly molding machines. This booklet is profusely illustrated, and contains some interesting data on the cost of molding machines. Various types of plain stripping plate and combination roll-over, stripping plate machines are described. The catalog contains 40 pages.

MOLDING MACHINES.—The Garvin Machine Co., Varick, N. Y., has issued a pocket edition of its catalog describing various types of plain and universal molding machines, slotting machines, grinding machines, tapping machines and duplex horizontal drills. The booklet contains 47 pages, and considering its diminutive size, the illustrations are exceptionally large and clear.

ELECTRIC WELDING MACHINES.—Various improved types of electric spot and butt welders are described in an interesting 39-page catalog recently issued by the Winfield Electric Welding Machine Co., Warren, O. The book includes considerable data on spot welding in general, including information regarding the comparative cost of electric and mechanical welding.

OIL INDICATOR.—Bulletin No. 57, recently issued by the Richardson-Phenix Co., of Milwaukee, Wis., illustrates and describes how the Phenix sight flow indicator can be inserted in any pipe line carrying a liquid, and how it shows at a glance or indicates electrically by lighting a lamp or ringing a bell when the flow of liquid is interrupted. Several recent improvements in the sight flow indicator are also described, showing how it is now possible to adjust the indicator so that it will give an alarm before the liquid stops flowing entirely. This improvement has made it especially suitable for use on water cooled transformers.

POWER CHAINS AND SPROCKETS.—An unusually complete catalog on power chains and sprockets has recently been issued by the Diamond Chain & Mfg. Co., Indianapolis, Ind. It contains 96 pages and includes illustrations, descriptive matter, and specifications covering all kinds of chains and sprockets. Some interesting chapters on chain driving in general are also included in the book.

FIRE BRICK.—The Ashland Fire Brick Co., Ashland, Ky., has recently issued a bulletin illustrating various shapes of standard 9-inch fire brick, as recently adopted by the Refractories Manufacturers' Association. In the past nearly every manufacturer of fire brick had sizes and standards of his own which caused trouble and confusion. The new standard sizes aim to do away with the difficulties which arose from this condition.

PUNCHES AND SHEARS.—An unusually handsome catalog of 166 pages, has been issued by Henry Pels & Co., 90 West street, New York, describing various sizes of Pels' punching machines, beam shears, bolt shears, scrap shears, bar croppers, billet shears, coping machines, etc. These tools are built with structural steel frames. The various machines are fully described in the catalog, and are illustrated by carefully constructed woodcuts.

STEEL SHEET PILING. — Bulletin No. 106, issued by the Lackawanna Steel Co., Lackawanna, N. Y., under date of January, 1914, describes and illustrates some interesting recent applications of Lackawanna steel sheet piling. A record of some tests on the strength of the joint between the sheet pile units is given on pages 8 to 10. Among other things, the illustrations show how two lengths of sheet piling may be joined together by splice bers and driven successfully.

COST OF POWER.—The Uehling Instrument Co.'s bulletin, No. 100, on combustion and the cost of power is now running through its second edition. The booklet contains 36 profusely illustrated pages and includes chapters on boiler room economy, the elementary chemistry of combustion, heat losses in boilers and chimneys, and an explanation of the method of measuring the amount of carbon-dioxide in flue gas. The latter information is very interesting.

ELECTRIC CRANES.—The Northern Engineering Works, Detroit, Mich., has recently issued a condensed catalog describing and illustrating its line of electric traveling cranes, hand power traveling cranes, electric and pneumatic hoists, bucket handling cranes, railroad cranes and overhead truck systems. Numerous illustrations are presented showing typical installations of cranes in all parts of the world. The catalog also contains specifications of the various standard sizes of cranes.

IRON AND STEEL PRICES

Corrected up to Tuesday noon

PIG IRON

(First half delivery.)

Bessemer, valley	$14.00
Bessemer, Pittsburgh	14.90
Basic, Pittsburgh	13.90
Basic, eastern Pa.	14.25 to 14.50
Malleable, Pittsburgh	14.15 to 14.40
Malleable, Chicago	14.25
Malleable, Philadelphia	15.50 to 15.75
Malleable Buffalo	13.50 to 14.00
No. 1X Philadelphia	15.25 to 15.50
No. 2 foundry, Pittsburgh	14.15 to 14.40
No. 2 foundry, Cleveland	14.00 to 14.25
No. 2 foundry, Ironton	13.50
No. 2 foundry, Chicago	14.25
No. 2X foundry, Philadelphia	14.80 to 15.25
No. 2X foundry, New York	14.75 to 15.25
No. 2X foundry, Buffalo	13.50 to 14.00
No. 2 plain, Philadelphia	14.50 to 14.75
No. 2 plain, New York	14.50 to 14.75
No. 2 plain, Buffalo	13.75
No. 2 southern, Birmingham	10.75 to 11.00
No. 2 southern, Cincinnati	13.75 to 14.25
No. 2 southern, Chicago	14.85 to 15.85
No. 2 southern, Philadelphia	14.75 to 15.00
No. 2 southern, Cleveland	15.00 to 15.35
No. 2 southern, New York	14.75 to 15.25
No. 2 southern, St. Louis	14.50 to 15.00
Virginia, 2X, Philadelphia	15.30 to 15.55
Virginia, 2X, Jersey City	15.60 to 15.85
Virginia 2X, New Eng., all rail	16.20 to 16.70
Gray forge (eastern Pa.)	13.90 to 14.25
Gray forge, Pittsburgh	13.65 to 13.90
Gray forge, Birmingham	9.75 to 10.25
Silveries, 5 per cent, Cleveland	17.30 to 17.55
Silveries, 5 per cent, Birmingham	12.50
Silveries, 5 per cent, Chicago	16.85
Silveries, 8 per cent furnace	15.75 to 16.00
Standard low phos., Phila.	21.00
Lebanon low phos., furnace	17.00 to 17.50
Charcoal, Lake Superior, Chgo., Nos. 1 to 4	15.50 to 16.50
Charcoal, Buffalo	16.00 to 17.00
Charcoal, Birmingham	25.00
Middlesbrough, No. 3, Phila., ex ship	15.00 to 15.25

IRON ORE

(Lower lake ports.)

Old range Bessemer, 55 per cent	$4.40
Mesabi Bessemer, 51½ per cent	4.15
Old range, non-Bes., 55 per cent	3.60
Mesabi, non-Bessemer, 51½ per cent	3.40

(Per unit Philadelphia.)

Foreign Bess., 50 to 65 per cent	7 to 8c
Foreign non-Bess., 50 to 65 per cent.	7 to 8c

COKE

(At the ovens.)

Connellsville furnace	$1.90 to 2.00
Connellsville fur. contr	2.00 to 2.10
Connellsville foundry	2.40 to 2.65
Connellsville fdy., contr	2.50 to 2.75
Wise county furnace	1.90 to 2.10
Wise county foundry	2.50 to 3.10
Pocahontas furnace	2.00 to 2.40
Pocahontas foundry	2.50 to 2.75
New River, foundry	2.75 to 3.50
New River, furnace	2.50 to 2.75

FERRO-ALLOYS

Ferro-manganese, Baltimore	$38.00 to 39.00
Ferro-silicon, 50 per cent, Pbgh.	71.00 to 73.00
Ferro-silicon, 50 per cent, Phila.	71.00 to 73.00
Ferro-sil., 12 to 13 per cent, Pgh.	22.90
Ferro-sil., 11 to 12 per cent, Pgh.	21.90
Ferro-sil., 10 to 11 per cent, Pgh.	20.90
Ferro-sil., 9 to 10 per cent, Pgh.	19.90
Ferro-carbon titanium, carloads, per lb.	8c to 12½c

SEMI-FINISHED STEEL

Bes. billets, Pbgh. and Yn.	$21.00
Open-hearth bil., Pbgh. and Yn.	21.00
Open-hearth bil., Phila.	23.40 to 24.40
Bes. sheet bars, Pbgh. and Yn.	22.00
Op.-h'rth sh. bars, Pbgh. & Yn.	22.00
Forging billets, Phila.	27.40 to 28.40
Forging billets, Pittsburgh	25.00 to 26.00
Wire rods, Pittsburgh	26.00 to 26.50

RAILS AND TRACK MATERIAL

Stand. Bess., rails, Pbgh.	1.25c
Stand. open-hearth rails, Pbgh.	1.34c
Light rails, 8 lbs., Pbgh. or Chi.	1.40c
Lgt. rails, 12 lbs., Pbgh. or Chgo.	1.35c
Lgt. rails, 16 to 20 lb., Pbgh. or Chicago	1.30c
Lgt. rails, 25 to 45 lbs., Pbgh. or Chicago	1.25c
Relaying rails, standard, Chgo.	23.00 to 24.00
Relaying rails, light, Chicago	$21.50 to 22.50
Angle bars, st. sect. Pbgh., base	1.50c
Angle bars, st., sections, Chgo.	1.50c
Spikes, railroad, Pbgh.	1.45c to 1.50c
Spikes, railroad, Chgo.	1.55c
Track bolts, Pbgh.	2.00c
Track bolts, Chgo.	2.00c

SHAPES, PLATES AND BARS

Structural shapes, Pittsburgh	1.20c
Structural shapes, Chicago	1.33c to 1.38c
Structural shapes, Philadelphia	1.30c to 1.35c
Structural shapes, New York	1.31c to 1.36c
Structural shapes, San Francisco	2.00c to 2.05c
Tank plates, Chicago	1.33c to 1.38c
Tank plates, Pittsburgh	1.15c to 1.20c
Tank plates, Philadelphia	1.30c to 1.35c
Tank plates, New York	1.31c to 1.36c
Bars, soft steel, Pittsburgh	1.15c to 1.20c
Bars, soft steel, Chicago	1.33c to 1.38c
Bars, soft steel, Philadelphia	1.35c to 1.40c
Bars, soft steel, New York	1.36c to 1.41c
Hoops, carloads, Pittsburgh	1.25c to 1.30c

Freight Rates, Finished Material

From Pittsburgh, carloads, per 100 pounds, to:—

New York	16 cents
Philadelphia	15 cents
Boston	18 cents
Buffalo	11 cents
Baltimore	14½ cents
Cleveland	10 cents
Cincinnati	15 cents
Chicago	18 cents
Denver	67½ cents
St. Louis	22½ cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast, plates and shapes	80 cents

Hoops, less carloads, Pittsburgh	1.35c
Bands, Pittsburgh	1.15c to 1.20c
Shafting, carloads, Pbgh., disc.	63 to 65
Shaft'g, less carl'ds, Pbgh., disc	58 to 60
Bar iron, Chicago	1.15c to 1.20c
Bar iron, Philadelphia	1.22½ to 1.32½c
Bar iron, New York	1.25c to 1.30c
Bar iron, Cleveland	1.20c to 1.25c
Bar iron, Pittsburgh	1.30c to 1.35c
Hard steel bars, Chicago	1.30c
Smooth finish'g mchy. steel, Chi.	1.68c

SHEETS AND TIN PLATE

No. 28, black, Pittsburgh	1.90c to 2.00c
No. 28 black, Chicago	2.08c to 2.13c
No. 28, tin mill, black, Pbgh.	1.85c to 1.95c
No. 28, galvanized, Pbgh.	2.90c to 3.00c
No. 28, galvanized, Chgo.	3.08c to 3.13c
No. 28, cor. galv., Pbgh.	3.00c to 3.10c
No. 28, painted cor., Pbgh.	2.10c to 2.20c
No. 10, blue annealed, Pbgh.	1.40c to 1.45c
No. 10, blue annealed, Phila.	1.55c to 1.60c
Tin plate, 100 lb., coke, base	$3.40

IRON AND STEEL PIPE

(Pittsburgh.)

	Black Butt-weld.	Galv.
Steel, ⅜ to 3 inches	79½	71
Iron, ⅜ to 2½ inches	70	61
	Lap-weld.	
Steel, 2½ to 6 inches	79	70½

BOILER TUBES

Steel, 3½ to 4½ inches	71
Iron, 3½ to 4½ inches	60

WIRE PRODUCTS

Wire nails, jobbers, Pittsburgh	$1.60
Wire nails, retailers, Pittsburgh	1.65
Plain wire, jobbers, Pittsburgh	1.40
Plain wire, retailers, Pittsburgh	1.45
Galvanized wire, jobbers, Pbgh.	1.80
Galvanized wire, retailers, Pbgh.	1.85
Polished staples, Pbgh.	1.60
Galvanized staples, Pbgh.	2.00
Barb wire, painted, jobbers, Pbgh.	1.60
Barb wire, painted, retailers, Pbgh.	1.65
Barb wire, galv., retailers, Pbgh.	2.05
Barb wire, galv., jobbers, Pbgh.	2.00

BOLTS AND NUTS

(Delivered within 20-cent freight radius.)

Carriage bolts, ⅜ x 6 inches, smaller and shorter, rolled threads, 80 and 2½; cut threads, 75 and 17½; larger and longer, 70 and 15.

Machine bolts and hot pressed nuts ⅜ x 4 inches, smaller and shorter, rolled, 80 and 7½; cut, 80 and 2½; larger and longer, 70, 10 and 10.

Gimlet and cone point lag or coach screws, 80 and 20.

Hot pressed square, blank and tapped nuts, $6.00 off list; hot pressed hexagon blank or tapped, $6.70.

Cold pressed, C. & T. square, blank, or tapped, $3.80 off; hexagon, blank or tapped, ⅝ inch and larger, $6.80; ½-inch and smaller, $7.40.

RIVETS

Structural rivets, Pbgh.	1.60c to 1.65c
Structural rivets, Chgo.	1.73c to 1.78c
Boiler rivets, Pbgh.	1.70c to 1.75c
Boiler rivets, Chgo.	1.83c to 1.88c

SCREWS

(New York.)

Lag, gimlet and cone point	80 and 20
Coach, gimlet point	80
Standard jack	70 and 10
Mch., cut thread, flat head	50 and 10
Mach., cut thread, round head	50 and 10 and 10
Mch., cut thread, fillister hd.	40 and 40 and 10
Mch., rolled thread, flat head or round head	80 and 10
Set screws, iron	75 and 10 and 10
Set screws, steel, per cent advance over iron	25
Square head cap screws	70 and 10 and 10
Hexagon head cap screws	70 and 10 and 10
Fillister head cap screws	60 and 10 and 10
Flat head wood screws	10 and 10 and 5
Round head wood screws	10 and 10 and 5

WASHERS

(Iron or steel, New York.)

⅛-inch	5.90c
⅜-inch	5.00c
½-inch	3.90c
⅝-inch	3.70c
¾-inch	3.60c

STEEL SHEET PILING

(Pittsburgh.)

Base sizes	1.55c to 1.60c

TWISTED REINFORCING BARS

(Soft steel, Pittsburgh mill.)

¾-inch and larger	1.25c
⅝-inch	1.30c
½-inch	1.35c
⅜-inch	1.50c
¼-inch	1.75c

IRON AND STEEL PRICES

Corrected up to Tuesday noon

TACKS

(New York.)

	Discount.
American carpet tacks	90 and 20 and 10
American cut tacks	90 and 20 and 10
Railroad tacks	90 and 40
Gimp tacks	90 and 20 and 10
Finishing nails	70

WIRE ROPE

Galvanized, iron and steel	47½ and 2½
Bright, iron and steel	55 and 2½

TRIANGLE REINFORCING MESH

(Per 100 square feet f. o. b. mill, car loads.)

No. 4, plain	$1.00
No. 4, galvanized	1.12
No. 7, plain	.49
No. 7, galvanized	.55
No. 23, plain	1.69
No. 23, galvanized	1.88
No. 26, plain	1.17
No. 26, galvanized	1.30
No. 27, plain	.96
No. 27, galvanized	1.07
No. 31, plain	2.49
No. 31, galvanized	2.76
No. 35, plain	1.17c
No. 35, galvanized	1.30
No. 39, plain	3.05
No. 39, galvanized	3.38
No. 43, plain	1.10
No. 43, galvanized	1.23

SPIRAL RIVETED PIPE

(Per 100 linear feet, f. o. b. factory.)

4-inch, plain	$ 19.76
4-inch, galvanized	30.74
6-inch, plain	33.05
6-inch, galvanized	49.73
8-inch, plain	43.17
8-inch, galvanized	65.00
10-inch, plain	66.42
10-inch, galvanized	96.15
12-inch, plain	83.75
12-inch, galvanized	118.30
14-inch, plain	99.14
14-inch, galvanized	138.85
16-inch, plain	117.53
16-inch, galvanized	166.58
20-inch, plain	183.79
20-inch, galvanized	248.39
24-inch, plain	219.92
24-inch, galvanized	293.99
30-inch, plain	324.81
30-inch, galvanized	430.64

CAST IRON PIPE

Three to 24 in., Cleveland	$22.35 to 22.80
Four-inch, water, Chicago	26.50
Six to 12 inches, Chicago	24.50
Larger sizes, Chicago	24.00
Six inch, water, New York	22.00 to 23.00
Four-inch, water, Birmingham	21.50
Six inch and larger, Birmingham	19.50

Gas pipe, $1 per ton higher than water.

WAREHOUSE PRICES

Steel bars, Chicago	1.65c
Steel bars, Cleveland	1.80c
Steel bars, Cincinnati	1.75c to 1.90c
Steel bars, Philadelphia	1.75c to 1.80c
Steel bars, New York	1.90c
Iron bars, Chicago	1.65c
Iron bars, Cleveland	1.75c
Iron bars, Cincinnati	1.70c to 1.80c
Iron bars, Philadelphia	1.65c to 1.70c
Hoops, Chicago	2.15c
Shapes and plates, Chicago	1.75c
Shapes and plates, Cleveland	1.90c
Shapes and plates, Cincinnati	1.85c to 1.90c
Shapes and plates, Philadelphia	1.75c to 1.80c
Shapes and plates, New York	1.95c
No. 10 blue ann. sheets, Chgo.	1.95c
No. 10 blue ann. sheets, Cleve.	2.15c
No. 10 blue ann. sheets, Cinci.	2.00c to 2.05c
No. 28 black sheets, Chgo.	2.55c
No. 28 black sheets, Cleveland	2.60c
No. 28 black sheets, Cincinnati	2.45c to 2.55c
No. 28 galv. sheets, Chgo.	3.60c
No. 28 galv. sheets, Cleveland	3.60c
No. 28 galv. sheets, Cincinnati	3.45c to 3.55c

IRON AND STEEL SCRAP

(Net tons.)

No. 1 railroad wrought, Chgo.	$ 8.50 to 9.00
No. 1 railroad wrought, Cleve.	9.50 to 10.00
No. 1 R. R. wght., eastern Pa.	14.00 to 14.50
No. 1 railroad wrought, St. L.	7.75 to 8.00
No. 1 railroad wrought, Cinci.	8.50 to 9.00
No. 2 railroad wrought, Chgo.	8.00 to 8.50
No. 2 railroad wrought, St. L.	7.50 to 7.75
Arch bars and transoms, Chgo.	12.00 to 12.50
Arch bars and transoms, St. L.	11.00 to 11.50
Knuckles, coup. and spr'gs, Chgo.	9.00 to 9.50
Knuckles, coup., and sp'gs, St. L.	9.00 to 9.25
Shafting, Chicago	11.50 to 12.00
Shafting, St. Louis	13.00 to 13.50
Steel car axles, Chgo.	12.25 to 12.75
Steel car axles, St. Louis	11.50 to 11.75
Locomotive tires, Chicago	10.00 to 10.50
Locomotive tires, St. Louis	9.00 to 9.50
Cut forge, Chicago	8.00 to 8.50
Pipes and flues, Chicago	6.50 to 7.00
Pipes and flues, Cleveland	8.00 to 8.50
Pipes and flues, St. Louis	6.50 to 7.00
No. 1 cast, Chicago	9.50 to 9.75
No. 1 cast, Cleveland	10.75 to 11.00

Freight Rates, Coke

Connellsville regions, per 2,000 lbs., to:—	
Baltimore	$1.80
Buffalo	1.85
Chicago	2.50
Cleveland	1.60
Detroit	2.10
East St. Louis	2.80
Joliet	2.50
Louisville	2.50
Milwaukee	2.70
New York	2.85
Philadelphia	2.05
Pittsburgh	.75
Richmond, Va.	2.94
Toledo	1.85
Valley furnaces	1.20
Cincinnati	2.00

No. 1 cast, Cincinnati	10.00 to 10.50
No. 1 cast, St. Louis	10.00 to 10.50
No. 1 busheling, Chicago	7.25 to 7.75
No. 1 busheling, Cleveland	8.50 to 9.00
No. 1 busheling, Cincinnati	6.25 to 6.75
No. 1 busheling, St. Louis	7.50 to 8.00
No. 2 busheling, Chicago	5.75 to 6.25
No. 1 boiler plate, cut, Chgo.	6.50 to 7.00
No. 1 boiler plate, cut, Buffalo	9.00 to 9.50
No. 1 boiler plate, cut, St. L.	6.00 to 6.50
Boiler punchings, Chicago	9.75 to 10.25
Cast borings, Chicago	4.25 to 4.75
Cast borings, Cleveland	6.00 to 6.50
Cast borings, Cincinnati	4.25 to 4.75
Cast borings, St. Louis	4.00 to 4.50
Machine shop turnings, Chgo.	4.75 to 5.25
Machine shop turnings, Cleve.	5.50 to 6.00
Machine shop turnings, Cinci.	4.50 to 5.00
Machine shop turnings, St. L.	4.50 to 5.00
Malleable, agricultural, Chgo.	8.50 to 9.00
Malleable, agricultural, St. Louis	7.25 to 7.50
Malleable, railroad, Chicago	9.75 to 10.25
Malleable, railroad, Cincinnati	6.50 to 7.00
Malleable, railroad, St. Louis	8.00 to 8.25
Angle bars, iron, Chgo.	11.75 to 12.25
Angle bars, iron, St. Louis	10.00 to 10.50
Angle bars, steel, Chgo.	8.25 to 8.75
Angle bars, steel, St. Louis	9.00 to 9.50
Stove plate, Chicago	9.00 to 9.50
Stove plate, Cleveland	8.25 to 8.75
Stove plate, Buffalo	9.75 to 10.00
Stove plate, Cincinnati	7.00 to 7.50
Stove plate, St. Louis	7.50 to 8.00
Bundled sheet, Cincinnati	4.75 to 5.25
Wrought iron pil'g plates, Clev.	13.00

(Gross Tons.)

Heavy melting steel, Pbgh.	$12.00
Heavy melting steel, Buffalo	10.00 to 10.50
Heavy melting steel, Chicago	9.25 to 9.75
Heavy melting steel, Cleveland	10.00 to 10.75
Heavy melting steel, Cincinnati	9.00 to 9.50
H'vy melting steel, eastern Pa.	11.00
Heavy melting steel, New York	8.50 to 9.00
Heavy melting steel, St. Louis	11.00 to 11.50
Bundled sheet, Buffalo	6.25 to 6.50
Grate bars, Buffalo	9.50 to 10.00
No. 1 railroad wr'ght, east. Pa.	13.00 to 13.50
No. 1 railroad wrought, Pbgh.	12.00 to 12.50
No. 1 R. R. wght., New York	11.00 to 11.50
No. 1 R. R. wrought, Buffalo	11.00 to 11.50
Shafting, New York	12.25 to 12.50
Pipes and flues, New York	8.00 to 8.25
Pipes and flues, eastern Pa.	10.50 to 11.00
Mch. shop turnings, New York	5.75 to 6.00
Machine shop turnings, Buffalo	5.50 to 6.00
Mach. shop turn'gs, eastern Pa.	8.00 to 8.50
Cast borings, New York	5.50 to 5.75
Cast borings, eastern Pa.	8.50 to 9.00
Cast borings, Buffalo	6.00 to 6.50
Cast borings, Pittsburgh	8.25 to 8.50
Stove plate, New York	7.50 to 7.75
Stove plate, Pittsburgh	9.50 to 9.75
Grate bars, New York	7.25 to 7.50
Shoveling steel, Chicago	9.00 to 9.50
Shoveling steel, St. Louis	9.00 to 9.50
Reroll'g rails, 5 ft. and ov., Pbgh.	13.50 to 14.00
Reroll. rails, 5 ft. and ov., Chgo.	11.25 to 11.75
Reroll. rails, 5 ft. and ov., Cleve.	11.75 to 12.25
Rerolling rails, 5 ft. and over, eastern Pa.	13.00 to 13.25
Reroll. rails, 5 ft. and ov., St. L.	12.00 to 12.50
Steel rails, short, Chicago	10.50 to 11.00
Steel rails, short, Cleveland	13.00 to 13.50
Steel rails, short, eastern Pa.	11.00 to 11.25
Steel rails, short, St. Louis	11.50 to 12.00
Iron rails, Cleveland	13.50 to 14.00
Iron rails, Cincinnati	10.50 to 11.00
Iron rails, eastern Pa.	15.00 to 16.00
Iron rails, St. Louis	12.00 to 12.25
Frogs, switches, guards, Chgo.	9.25 to 9.75
Frogs, switches and g'rds, St. L.	10.25 to 10.50
Car wheels, (iron), Pittsburgh	12.50 to 13.00
Car wheels (steel) Pittsburgh	13.50 to 14.00
Car wheels, Chicago	11.00 to 11.50
Car wheels, eastern Pa.	12.00 to 12.50
Car wheels, Buffalo	12.00 to 12.50
Car wheels, N. J. points	12.50 to 12.75
Car wheels, St. Louis	11.00 to 11.25
Iron axles, Pittsburgh	22.50 to 23.00
Iron axles, Cincinnati	19.00 to 20.00
Iron axles, eastern Pa.	20.00 to 21.00
Iron axles, Buffalo	21.50 to 22.00
Iron axles, Chicago	16.50 to 17.00
Steel car axles, New York	13.00 to 13.25
Steel car axles, Buffalo	15.00 to 15.50
Steel car axles, Cleveland	16.50 to 17.00
Steel car axles, eastern Pa.	15.25 to 15.75
No. 1 busheling, Buffalo	8.50 to 9.00
No. 2 busheling, Buffalo	6.00 to 6.50
Low phosphorus steel, Buffalo	15.00 to 15.50
Low phosphorus steel, Pbgh.	14.25 to 14.50
Low phos. steel, eastern Pa.	14.50 to 15.00
Malleable R. R. Buffalo	10.75 to 11.25
No. 1 forge, eastern Pa.	9.00 to 9.50
Pipes and flues, Eastern Pa.	10.50 to 11.00
No. 1 cast eastern Pa.	13.00 to 13.50
Bundled sheet, Cleveland	6.50 to 7.00
Boiler plate, Cleveland	7.50 to 8.00
Mal., R. R. east. Pa.	9.00 to 9.50
Mall. iron, agricul., Cleveland	9.00 to 9.50
Mall. iron R. R., Cleveland	10.50 to 11.00
Malleable, railroad, Pittsburgh	10.00 to 10.25
No. 1 cast, Pittsburgh	12.00 to 12.25
No. 1 busheling, Pittsburgh	10.00 to 10.25
Mch. shop turnings, Pbgh.	8.00 to 8.25
Bundled sheet, Pittsburgh	8.50 to 8.75
Stove plate, eastern Pa.	9.00 to 9.50
No. 1 heavy cast (N. J. points)	12.00 to 12.50

MISCELLANEOUS SHOP TOOLS

	Discount.
Standard files	80 and 5
Heavy hammers, 3 to 5 lb.	80 and 10
Heavy hammers, over 5 lb.	80 and 5
Gas pliers, 7-inch, per dozen	$2.00
Gas pliers, 12-inch, per dozen	3.50
Cold chisels, per pound	12c to 15c
Wrenches, Alligator, discount	75 and 80
Wrenches, drop forged S.	10 and 10

Gray Iron
CASTINGS
UP TO 10 TONS
Our facilities are EXCEPTIONAL—a FOUNDRY 160 x 80 ft.; a GENERAL MACHINE SHOP 400 x 80 ft., in which we can turn out work up to 16 ft. in dia.; and a large PATTERN SHOP complete in every detail.
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Woodmansee & Davidson, Inc.
ENGINEERS
All Kinds of Power Plants
SPECIALISTS in the Industrial Application of PRODUCER GAS
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Exceptional Service!
With a daily capacity of twenty tons; with equipment modern in every feature; with a location ideal for shipping purposes, we are prepared to make castings of any size up to 15 tons, giving you exceptional service.
GREY IRON and SEMI STEEL
CASTINGS
No matter how difficult your requirements may be, we guarantee you service and satisfaction.
Let us figure on your next specifications.
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Intricate Molding?
Yes, that's our specialty!
We'll be glad to figure on your requirements for intricate molding of all descriptions.
We have exceptional facilities for giving you service. We also specialize Gray Iron, Semi-Steel and Chilled Castings.
We have a capacity of 25 tons a day.
Write us.
PHOENIX MANUFACTURING CO.
EAU CLAIRE, WISCONSIN
WORKS ON NORTH SIDE

TISCO MANGANESE STEEL CASTINGS
FOR SEVERE SERVICE
Taylor-Wharton Iron & Steel Co.
High Bridge, New Jersey

New Home for Bureau of Mines

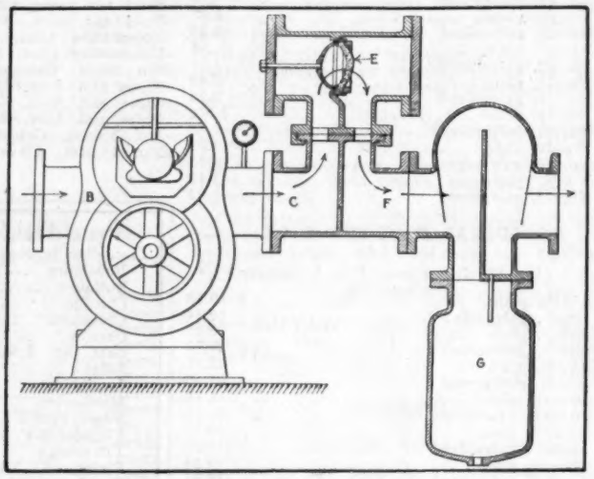
(*Continued from page 711*)

bureau of mines as an experiment station at Pittsburgh were loaned to the bureau by the war department when the bureau was created. The war department has suggested that it now needs these buildings and it is felt the bureau cannot retain possession much longer. The buildings are very old and are entirely unsuited to the needs of the bureau of mines work. It is said that the investigations have been seriously handicapped by the inadequacy of the structures now in use.

How to Dry Clean Producer Gas

(*Continued from page 714*)

primary cooler. It is then carried into an ordinary rotary pump *B* which delivers it under pressure through a porous diaphragm *E* by way of the passages *C* and *F*. A sump or separator *G* is provided in which the tar accumulates. The structure of the diaphragm is a matter of considerable importance if this method of cleaning is to be successful. It must be sufficiently porous to permit the gas and tar to pass freely, otherwise it will soon



DIAPHRAGM GAS CLEANER

become blocked with tarry deposits and fail to operate. Many materials have been tried for this purpose, but at present spun glass is preferred. The glass fibers are not affected by chemical action and seem to possess the necessary physical properties for successfully carrying on the process. The diaphragm consists of a layer of ordinary glass wool which is retained between two metal screens. Glass wool, not slag wool, must be used. The density of the diaphragm can be regulated by the quantity of glass used and the degree of compression maintained between the metal screens. Ordinarily, the diaphragm is ¼ inch in thickness and about 400 cubic feet of gas per hour can be handled by each square inch of diaphragm area.

Function of the Diaphragm

The diaphragm does not retain any of the tar, but changes its physical state. On the entering side, the tar exists in a large number of minute particles, ordinarily known as tar fog. After passing through the diaphragm, these particles coalesce, so that on the discharge side they are of relatively large dimensions. In fact the pellets are so large that they can no longer be carried forward by the gas current and immediately separate out by gravity.

It appears possible to secure almost any desired degree

of gas cleanness simply by regulating the pressure maintained across the diaphragm. In commercial operation it is found that a difference in pressure of from 2½ to 4 pounds will give a degree of gas cleanness that is ample for any ordinary requirements. Thirty cubic feet of gas cleaned in this manner can be passed through a white filter paper without producing any discoloration.

At low velocity, the gas will pass through the porous diaphragm without any apparent alteration and the effectiveness of the cleaning is directly related to the velocity of flow. No water is used in connection with the process, except that required to cool the gas. As a consequence, there is no production of tar emulsion and clear water flows from the condenser.

The first commercial equipment of this kind has now been in continuous operation for approximately 18 months. This outfit is handling gas for a 1,000-horsepower producer gas plant; the second commercial equipment to be installed is now handling gas for a 900-horsepower engine and has been in service for about 10 months. A cleaner designed to handle 200,000 cubic feet of gas per hour has recently been constructed. It consists of four cleaning diaphragms connected in series.

Alaska's Mineral Output

The value of the mineral output of Alaska in 1913 is estimated at $18,900,000 by Alfred H. Brooks, of the United States geological survey, as compared with $22,537,831 for 1912. The value of the gold output is estimated at $15,450,000; that of 1912 was $17,145,951. There was also very marked decrease in copper production, that of 1913 being estimated to have been 19,700,000 pounds, valued at about $3,014,000, while that of 1912 was 29,230,491 pounds, valued at $4,823,031. As the Alaska silver output is largely a by-product of gold and copper mining, this also showed a decrease in value from $316,839 in 1912 to about $220,000 in 1913. Other minerals, including marble, gypsum, tin, etc., are estimated to have been produced to the value of about $220,000 in 1913, or about the same as the value of the production of 1912.

Mineral Output is Quarter Billion

The territory has produced mineral wealth to the value of $248,300,000. Of this $228,200,000 is gold, $16,580,000 copper, $2,060,000 silver, $360,000 coal, and the balance tin, lead, marble, gypsum, petroleum, etc. Copper mining began in Alaska in 1901, and the total production is about 110,000,000 pounds.

There are several reasons for the decrease of over $3,500,000 in the value of Alaska's mineral output, as compared with the previous year. The most important of these is the condition of the placer mining industry, which, in spite of the advances made in lode mining, still furnishes two-thirds of the gold output. Less than 40 per cent of the placer gold is produced by large plants, the balance being still won from the rich gravels that can be profitably mined by hand methods. Therefore, marked fluctuation in the placer gold output is inevitable, due to exhaustion of bonanzas on one hand, and the discovery of new districts on the other. Moreover, these small operations are far more dependent on the local water supply than are the large plants. Under such conditions no stability of placer gold production is to be expected.

The value of the output of the drop forge establishments in the United States is about $11,000,000 per year. Of this total, the Ford Motor Co., of Detroit, uses about $5,000,000 worth in the manufacture of Ford automobiles.

Intelligent—Satisfactory Copy Service

February 21, 1914

The Iron Trade Review
Cleveland, Ohio

Gentlemen:

I enclose herewith O. K'd the suggestion sent with your letter of the 13th.

I wish to compliment you on the class of copy you are turning out for us. It is fine.

If all publications in which we are advertising would turn out as good copy as you do, not only we, but all advertisers would be better off.

If at any time a prospective advertiser should want to know something about your service in handling the copy, just tell them to send me a line, and I will give them my views of your copy.

Under separate cover I am sending you two cuts which you will use in several one page ads on our Shears.

If your page stuff is as good as the quarter page you have gotten up for me in the past, I will expect to have something pretty fine.

Yours respectfully,

JOHN R. POYSEN,
Advertising Manager for
The Canton Foundry & Machine Co.
Canton, Ohio

The above letter indicates the kind of *Copy Service Co-Operation* THE IRON TRADE REVIEW gives its advertisers through its efficient *Service Department* maintained for the *free* use of advertisers. Want to know more about it?

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Advertising Department
CLEVELAND, OHIO

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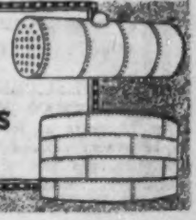

Opportunities

Men Wanted
Minimum, 50 words, $1.00. Each additional word, 2c. All capitals, 50 words, $1.50. Each additional word, 3c.

Position Wanted
Minimum, 25 words, 50c. Each additional word, 2c. All capitals, 25 words, 75c. Each additional word, 3c.

Miscellaneous Classified
Minimum, 25 words, $1.00. Each additional word, 4c. All capitals, 25 words, $2.00. Each additional word, 8c.

Men Wanted

ENGINEERS, SUPERINTENDENTS, foremen. Designers and Executive Office Men wanted; also cost accountants and experienced engineering salesmen. State fully experience in first letter. The Engineering Agency, Inc., 20th year, Chicago.

HEATER WANTED—MAN THOROUGHLY familiar with the heating of large sizes of wrought iron suitable for chain. State experience and wages expected. Address Box 129, THE IRON TRADE REVIEW, Cleveland.

WANTED — A COST ACCOUNTANT. Profer man who has had experience in this line to keep cost accounts, payroll and look after transportation. A simple, efficient system of accounting is required. Give age, state whether married or single, references, experience and salary expected. Address Box 135, THE IRON TRADE REVIEW, Cleveland, O.

WANTED—FIRST CLASS GENERAL foreman to take complete charge of foundry manufacturing cast iron water pipe. State experience, references and wages. Address Box 123, THE IRON TRADE REVIEW, Cleveland, O.

WANTED:—AN UP-TO-DATE CLERK for blast furnace office; experienced in above line and used to handling typewriter. Answer giving references to Box 137, THE IRON TRADE REVIEW, Cleveland, O.

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AS FOREMAN OF PATTERN SHOP. Over 12 years as foreman employing from 20 to 100 men. Broad experience with molding machines, gas and oil engines, and electrical machinery. Address Box 987, THE IRON TRADE REVIEW, Cleveland, O.

EXECUTIVE POSITION DESIRED: — Practical mechanic, 14 years foreman, good draftsman, extensive experience in foundry practice and pattern work, wood or metal and general shop practice. Address Box 113, THE IRON TRADE REVIEW, Cleveland, O.

WANTED — POSITION BY FIRST class rivet, screw and bolt operator; have had 16 years experience; have been foreman six years; can give good references. Address Box 105, THE IRON TRADE REVIEW, Cleveland, O.

TRAFFIC MANAGER OF WIDE RAILroad experience, familiar with iron and steel, purchasing, etc.; desires connection with industrial corporation. Interview requested. Address "Traffic", THE IRON TRADE REVIEW, Cleveland, O.

ROLL TURNER WANTS POSITION IN iron or steel works; experienced; references. Address Box 106, THE IRON TRADE REVIEW, Cleveland, O.

SITUATION WANTED—A COMPETENT man is open for engagement to take charge of boiler-plate or structural shop. Address Boiler Maker, THE IRON TRADE REVIEW, Cleveland, O.

WANTED: — POSITION AS SUPERINtendent or foreman by a thoroughly practical and capable man of 20 years experience in erecting iron stairways, railings, store fronts, and general ornamental iron work. Address Box 108, THE IRON TRADE REVIEW, Cleveland, O.

ENGINEER WHO HAS JUST FINISHED designing and superintending the construction of an open hearth plant and blooming mill, wishes to help build another mill. Address Box 114, THE IRON TRADE REVIEW, Cleveland, O.

MAN THOROUGHLY CONVERSANT with mill order, sales and invoice work; experienced correspondent and departmental executive, desires position with steel mill, jobber or railroad supply house. Address Box 136, THE IRON TRADE REVIEW, Cleveland, O.

YOUNG MAN, CLEAN CUT, AMBItious, has considerable engineering experience also several years sales experience, would like to represent some first-class concern in Pittsburgh, mechanical line preferred. Would be willing to start low. Address Box 115, THE IRON TRADE REVIEW, Cleveland, O.

POSITION WANTED BY EXPERIENCED draftsman on rolling mill work and machinery design. Age 36. Address Box 991, THE IRON TRADE REVIEW, Cleveland, O.

METALLURGICAL ENGINEER, AT present supervising metallurgical operation on large steel plant, desires change. Technical graduate, well qualified by fifteen years of practical experience, to undertake either routine control work or the development of special processes. Address Box 124, THE IRON TRADE REVIEW, Cleveland, O.

POSITION WANTED—BLAST FURNACE AND STEEL MILL. MASTER MECHANIC WILL BE OPEN FOR ENGAGEMENT MAY 1. WIDE EXPERIENCE WITH STEAM AND ELECTRIC POWER EQUIPMENTS, CONSTRUCTION AND OPERATION. ADDRESS BOX 132, THE IRON TRADE REVIEW, CLEVELAND, O.

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FOR SALE—170 ACRE COUNTRY EState on Lake Erie, 2,250 feet of lake front, on car line; gas well, water system, electric lights, unusually well equipped farm; fine buildings and soil; stock, tools and crops go with property. Harry R. Scobie, 405 Swetland building, Cleveland, O.

Miscellaneous

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